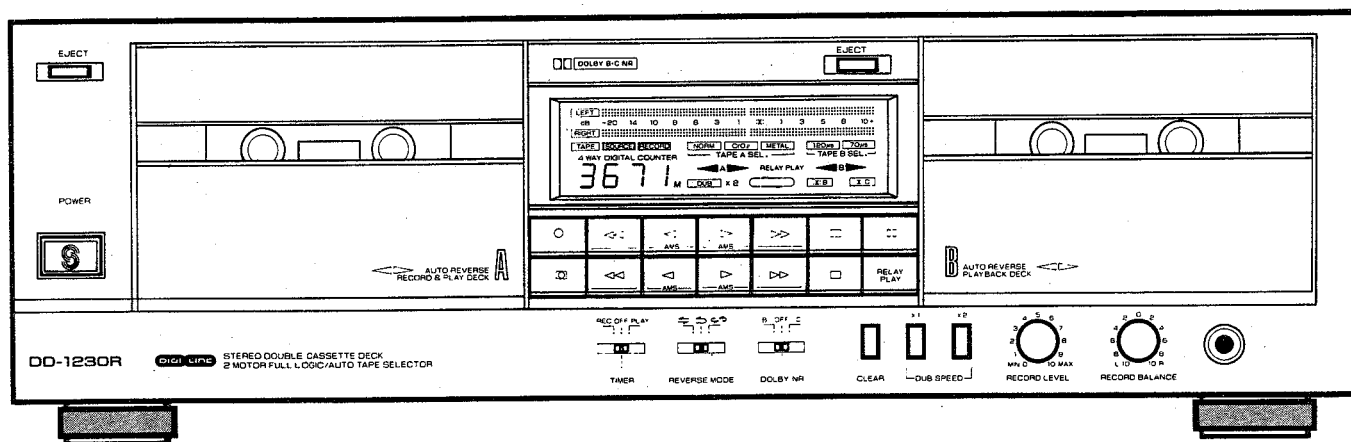


# SERVICE MANUAL

## DD-1230R

### AUTO REVERSE STEREO DOUBBLE CASSETTE DECK



#### CONTENTS

|                                      |    |                                      |                |
|--------------------------------------|----|--------------------------------------|----------------|
| To Service Personnel.....            | 2  | Top & Bottom View of P.C Boards..... | 15             |
| Specifications.....                  | 3  | Parts List & Exploded View of        |                |
| Electrical Adjustment Procedure..... | 4  | Deck Mechanism.....                  | 21             |
| Electrical Adjustment Point.....     | 6  | Parts List & Exploded View of        |                |
| Circuit Description.....             | 8  | Cabinet & Chassis.....               | 25             |
| Block Diagram.....                   | 11 | Point to Point Wiring Diagram.....   | 28             |
| Electrical Parts List.....           | 12 | Schematic Diagram.....               | Separate Sheet |

#### NOTICE

- This manual is for authorized and qualified service personnel, so the basic service procedure and commonsense of safety are not described in this manual.
- Sherwood always makes every endeavor to improve the products, therefore the specifications and data provided are subject to change without notice.

 **Sherwood**

# To Service Personnel

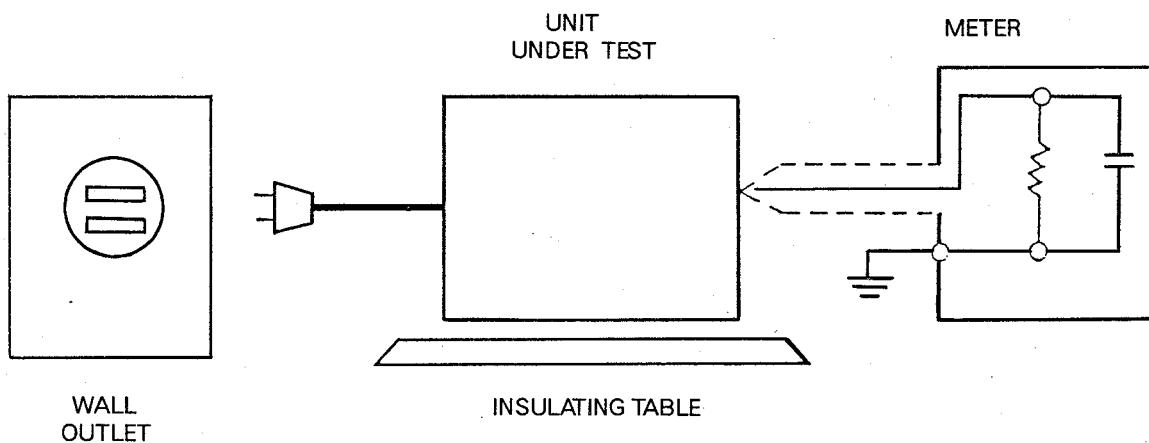
## 1. Critical Components Information.

The  $\triangle$  marked components on schematic diagram and parts list be replaced with the parts having specifications equal to those originally installed.

## 2. Leakage Current Measurement(For 120V Version only).

When the service has been completed, make sure that all exposed conductive surfaces are properly insulated from the power supply circuits.

- Leakage current meter should have an input impedance of 1500 ohms resistive shunted by  $0.15\mu\text{F}$  capacitor.
- Leakage current shall not be exceed 0.5mA.



3. Turn the unit OFF, and disconnect the power supply cord during disassembly and replacement of parts.

4. When the service has been completed, be sure to check all protective device and spacings before returning the unit to customer.

# Specifications

## Track Configuration

4 Track 2 Channel and a Rotary Reverse Type Head Stereo Double Cassette Deck

## Motor

Electronic Governor High Torque DC Motor×2

## Mechanism

1 Motor, 1-Solenoid Mechanism×2

## Heads

Rotary Reverse Head (Rec/Playback Head×1,Erase Head×1)

Rotary Reverse Head (Playback Head×1)

Tape speed 1-7/8ips (4.76cm/sec) ..... ± 1.0

(FWD/REV)

Wow Flutter (W.RMS).....No more than 0.12%(JIS)

No more than 0.2% (DIN)

Fast Winding Time (C-60).....About 90 sec.

## Input Sensitivity/Impedance

Line ..... 80mV/47 kohms

## Output Level/Load Impedance

Line ..... 500mV/1.6 kohms

## Signal to Noise Ratio (W.CCIR/ARM)

CrO<sub>2</sub> Tape with Dolby B/C NR.....More than 65/74dB

CrO<sub>2</sub> Tape without Dolby NR.....More than 56dB

## Frequency Response (±20dB Rec Dolby NR off)

Normal Tape ..... 35 Hz~17.5kHz±3dB

CrO<sub>2</sub> Tape without Dolby NR ..... 35 Hz~ 17 kHz±3dB

Metal tape.....35Hz~ 18 kHz±3dB

THD (a 1kHz, 0dB Rec).....No more than 1.8%

Channel Separation.....More than 39dB

## GENERAL SPECIFICATIONS

Power Consumption.....20Watts

Dimensions.....(W)440×(H)175×(D)280mm

(W)17.3×(H)4.9×(D)11inches

Weight.....6.2kg (13.6lbs)

### Power Supply

|                                      |                       |
|--------------------------------------|-----------------------|
| A : USA & CANADIAN MODEL.....        | 120V AC, 60Hz         |
| B : MULTI-VOLTAGE MODEL.....         | 120V/220V AC, 60/50Hz |
| C : GENERAL EUROPEAN MODEL.....      | 220V AC, 50Hz         |
| D : WEST GERMAN & ITALIAN MODEL..... | 220V AC, 50Hz         |
| E : BRITISH & AUSTRALIAN MODEL.....  | 240V AC, 50Hz         |
| F : SWISS & SCANDINAVIAN MODEL.....  | 220V AC, 50Hz         |

NOTE: Specifications and the design subject to change without notice for improvements.

# Electrical Adjustment Procedure

## 1. Before Measurements and Adjustments

### • General Conditions

The following general conditions apply to the electrical measurements and adjustments unless especially stated otherwise.

- Before making adjustment, operate the appliance for more than 2 minutes.
- Ambient temperature 20 to 25°C
- Dolby Slide switch SW off.
- The voltages have been measured relative to earth.
- Volume control recording level Volume max.
- The measurements and adjustments are relate to the left-hand channel.

The corresponding test points and adjusting elements for the right-hand channel are given in brackets.

- Since head magnetization, dust accumulation, etc. are likely to introduce in the various characteristics, it is very important that the heads are properly demagnetized and cleaned.
- Use 500mV (200nWb/m) for 0 dB as the standard level of the unit.
- Proceed with the recording system adjustment after having finished the playback section adjustment.

## 2. Instruments required

- Audio frequency oscillator
- ACVM or dual channel (ACVM, mV-meter)
- Frequency counter
- WOW/FLUTTER meter
- Oscilloscope

## 3. Test Cassete

- TCC-153..... Azimuth
- TCC-122..... Tape Speed, -10dB
- TCC-130..... Playback Level (Dolby NR ref. tape)
- TCC-184..... Playback Frequency Response
- Reference Tape
  - Normal..... TDK AD-60
  - CrO<sub>2</sub>..... TDK SA-60
  - Metal..... TDK MAX-60

## Playback section

| Adjustments                 | Test tape                                   | Mode                     | Apply signal to | Measure on  | Read on                    | Adjust with                         | Adjust to  |
|-----------------------------|---|--------------------------|-----------------|-------------|----------------------------|-------------------------------------|--|
| Head Azimuth                | TCC-153<br>10 kHz<br>(A. BEX)               | FWD Play<br>(A & B Deck) |                 | Line Output | ACmV-meter<br>Oscilloscope | Head adjusting screw<br>(left side) | Max<br>• Lissajous' figure become a straight line with an angle 45 degrees <sup>*a</sup> |
|                             |   | REV Play<br>(A & B Deck) |                 |             |                            | (right side screw)                  |  |
| Playback Speed normal       | TCC-111<br>3 kHz, ± 10 dB<br>(A. BEX)       | Play<br>(A & B Deck)     |                 | Line Output | Wow and Flutter            | Meter <sup>*b</sup>                 | 3000 Hz ± 15 Hz  |
| Playback Sensitivity        | TCC-130<br>400 Hz 0 dB<br>(A. BEX)          | Play<br>(A & B Deck)     |                 | Line Output | ACmV-meter                 | A deck<br>VR109L/R                  | 500mV  |
|                             |   |                          |                 |             |                            | B deck<br>VR201L/R                  |  |
| Playback frequency response | TCC-184B<br>12.5 k/1 kHz<br>/63 Hz (A. BEX) | Play<br>(A & B Deck)     |                 | Line Output | ACmV-meter                 |                                     | See graph<br>Fig. 2 frequency response   |

## Recording section

| Adjustments              | Test tape        | Mode      | Apply signal to | Measure on | Read on           | Adjust with | Adjust to                    |
|--------------------------|------------------|-----------|-----------------|------------|-------------------|-------------|------------------------------|
| OSC                      | MAX-60<br>(TDK)  | REC/PAUSE |                 | C442       | Frequency Counter | L443        | 105 kHz                      |
| 105 kHz trap suppression | MAX-60<br>(TDK)  | REC/PAUSE |                 | TP2L/R     | ACmV-meter        | L441L/R     | Minimize the reading on ACVM |
| Target value BIAS        | METAL            | REC/PAUSE |                 | TP1L/R     | ACmV-meter        | VR441L/R    | 7.5mV                        |
|                          | CrO <sub>2</sub> | REC/PAUSE |                 |            |                   | VR445       | 5.0mV                        |
|                          | Normal           | REC/PAUSE |                 |            |                   | VR446       | 3.0mV                        |



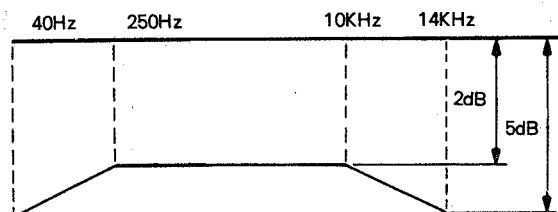
|                       |                   |                   |   |             |            |                          |   |
|-----------------------|-------------------|-------------------|---|-------------|------------|--------------------------|---|
| Recording sensitivity |                   | REC/PLAY<br>PLAY  | 400 Hz to<br>Line input   | Line output | ACmV-meter | LF generator             | 500mV   |
|                       |                   |                   |   |             |            |                          | 500mV *c  |
| Bias                  |                   | REC/PLAY          |   | TP1L/R      | ACmV-meter | See target<br>Value bias |   |
|                       |                   |                   | 400 Hz to<br>Line input   |             | ACmV-meter | LF generator             | 50mV  |
|                       |                   |                   | 40 Hz-6.3 kHz    Record a number of frequencies<br>10 kHz-12 kHz    with the same input voltage<br>14 kHz-16 kHz    and play them back to Line input. |             |            |                          |   |
|                       |                   | PLAY              |   | Line Output | ACmV-meter |                          | See Fig. 3 if<br>it necessary<br>repeat bias<br>adjustment *d |
| 19 kHz<br>suppression | Arbitrary<br>tape | REC               | 400 Hz to<br>Line output  | Line output | ACmV-meter | LF generator             | 500mV   |
|                       |                   | Dolby NR<br>SW ON | 19 kHz to<br>Line input   | Line output |            | L301L/R                  | Minimise the<br>reading on ACVM                               |

# **NOTE:**

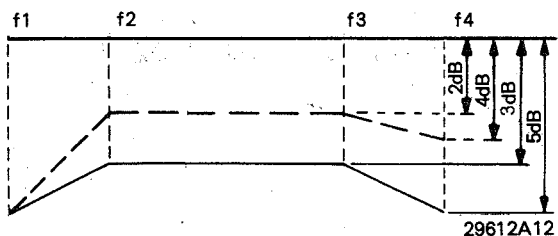
- \*a. Prior to any measurement or adjustment with the tape running, head should be degaussed and cleaned. Confer see Fig. (Electrical ADJ Point)
- \*b. The max. permissible speed variation  $\pm 0.5\%$ . Moreover the Wow-and-Flutter can be read. This value should not exceed 0.1%.
- \*c. The voltage on Line Output should read  $500\text{mV} \pm 20\text{mV}$ .

If this is not the case reduce the LF signal (bias disabled) by as the reading was too low or too high by means of VR401L/R

- \*d. When the channel is adjusted this may slightly affect the adjust If the adjustment is correct the frequency response curve will be in Fig. 3 distortion  $\leq 3\%$ .

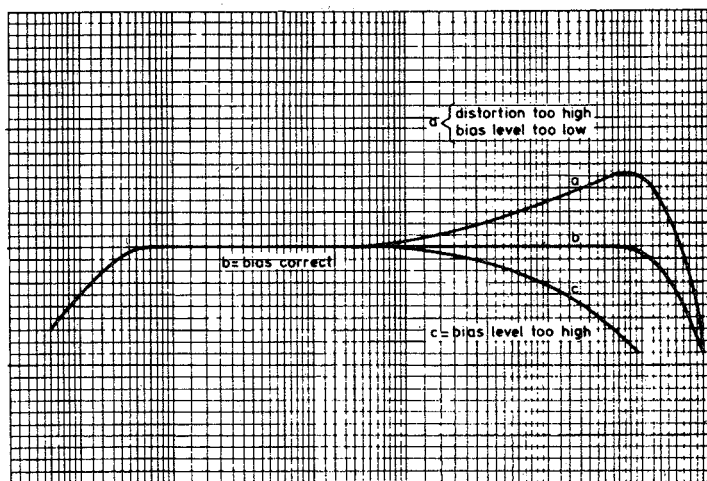


**Fig. 1**



**Fig. 2**

|        | f1   | f2    | f3      | f4    |
|--------|------|-------|---------|-------|
| Metal  | 30Hz | 100Hz | 12.5KHz | 18KHz |
| CrO2   | 30Hz | 100Hz | 12.5KHz | 16KHz |
| Normal | 30Hz | 100Hz | 12.5KHz | 16KHz |



**Fig. 3**

29476A12

4002315910  
INPUT B'D

R-OUT R-IN  
L-OUT L-IN

VR501L  
METER LEVEL ADJ.

TP3R  
VR401R  
VR501R  
GND

TP3L  
VR401L  
REC LEVEL ADJ.

L302L  
L301L  
TP4L  
TP4R  
L301R  
MPX FILTER ADJ.

TP15

VR445 VR446  
NOR BIAS ADJ.  
CR02 BIAS ADJ.

TP2L  
TP2R  
TP1L  
TP1R

B-DECK  
A-DECK  
DOUBLE SPEED ADJ.

REC TRAP  
L441L  
L442L  
L443  
VR441L  
VR441R  
OSC FREQ ADJ.

BLK  
WH

TIMER  
REC-OFF-PLAY  
REVERS MODE  
DOLBY  
B OFF C

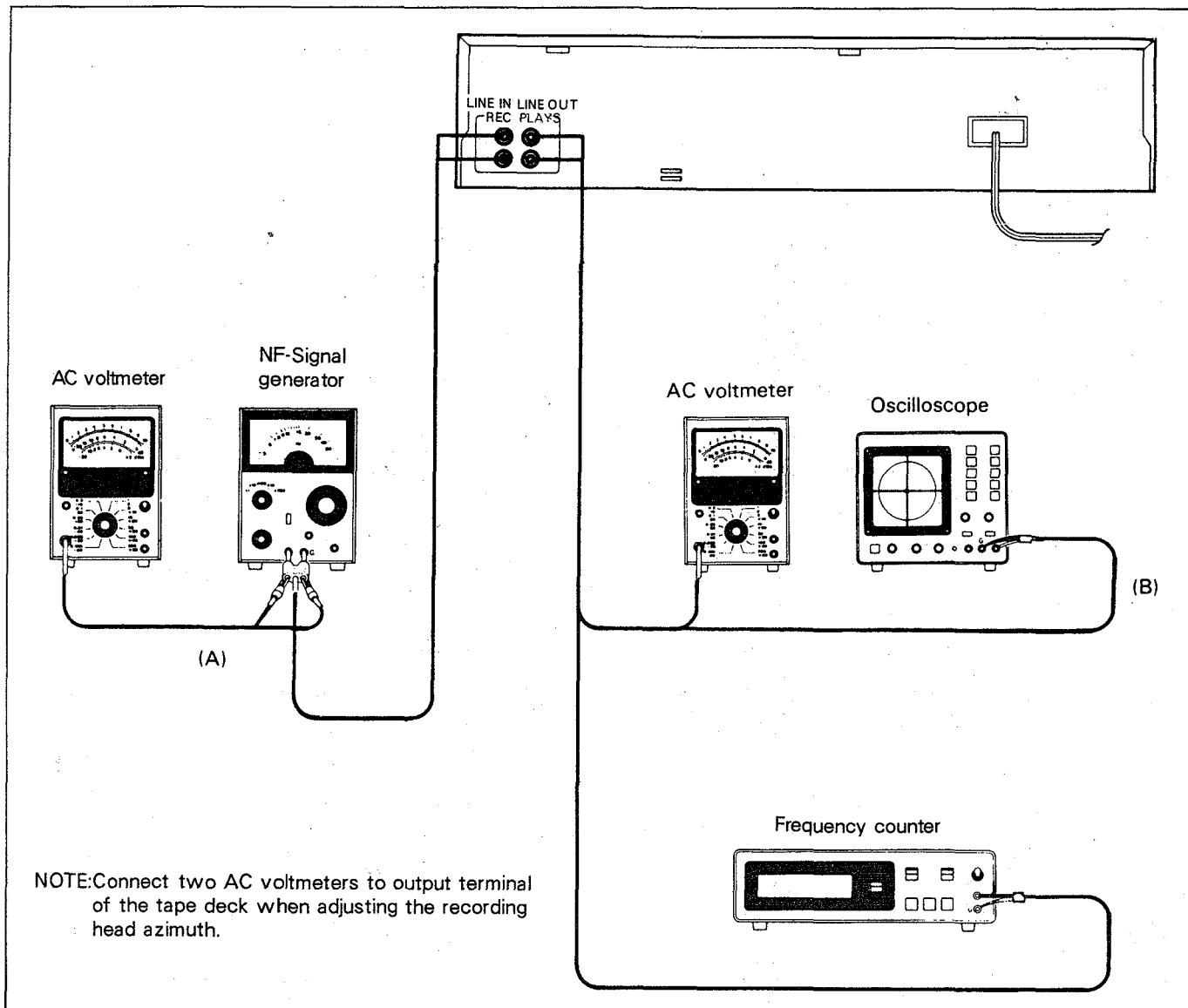
VR109L  
VR109R  
VR101  
VR102  
VOLUME  
BALANCE

B-DECK  
PB LEVEL ADJ.  
A-DECK  
PB LEVEL ADJ.

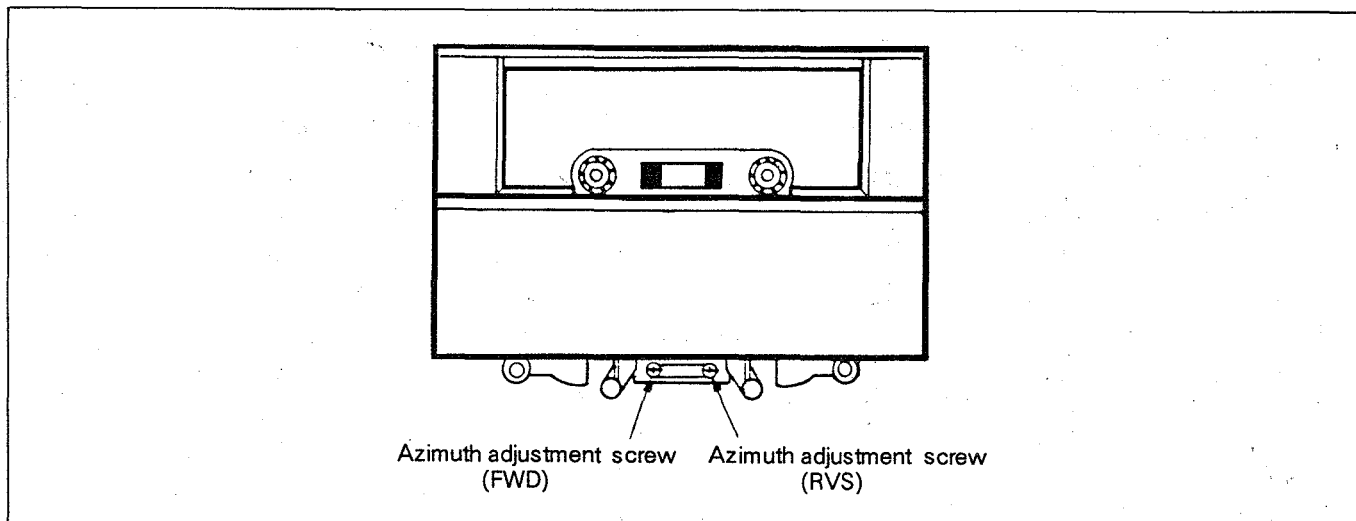
VR210L  
VR210R

MAIN BOARD 4002315900

## - TEST EQUIPMENT CONNECTIONS

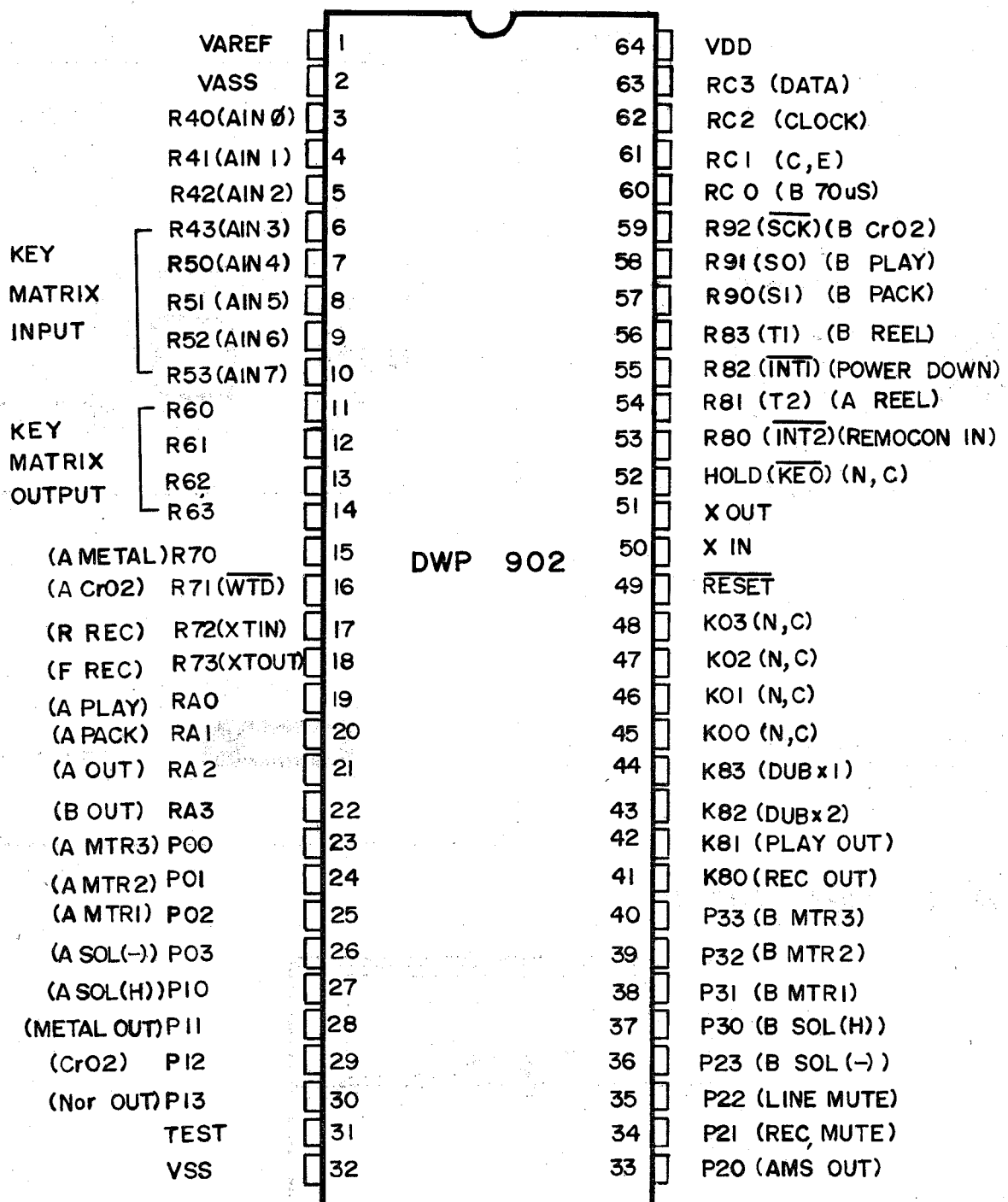


## - AZIMUTH ADJUSTMENT POINT

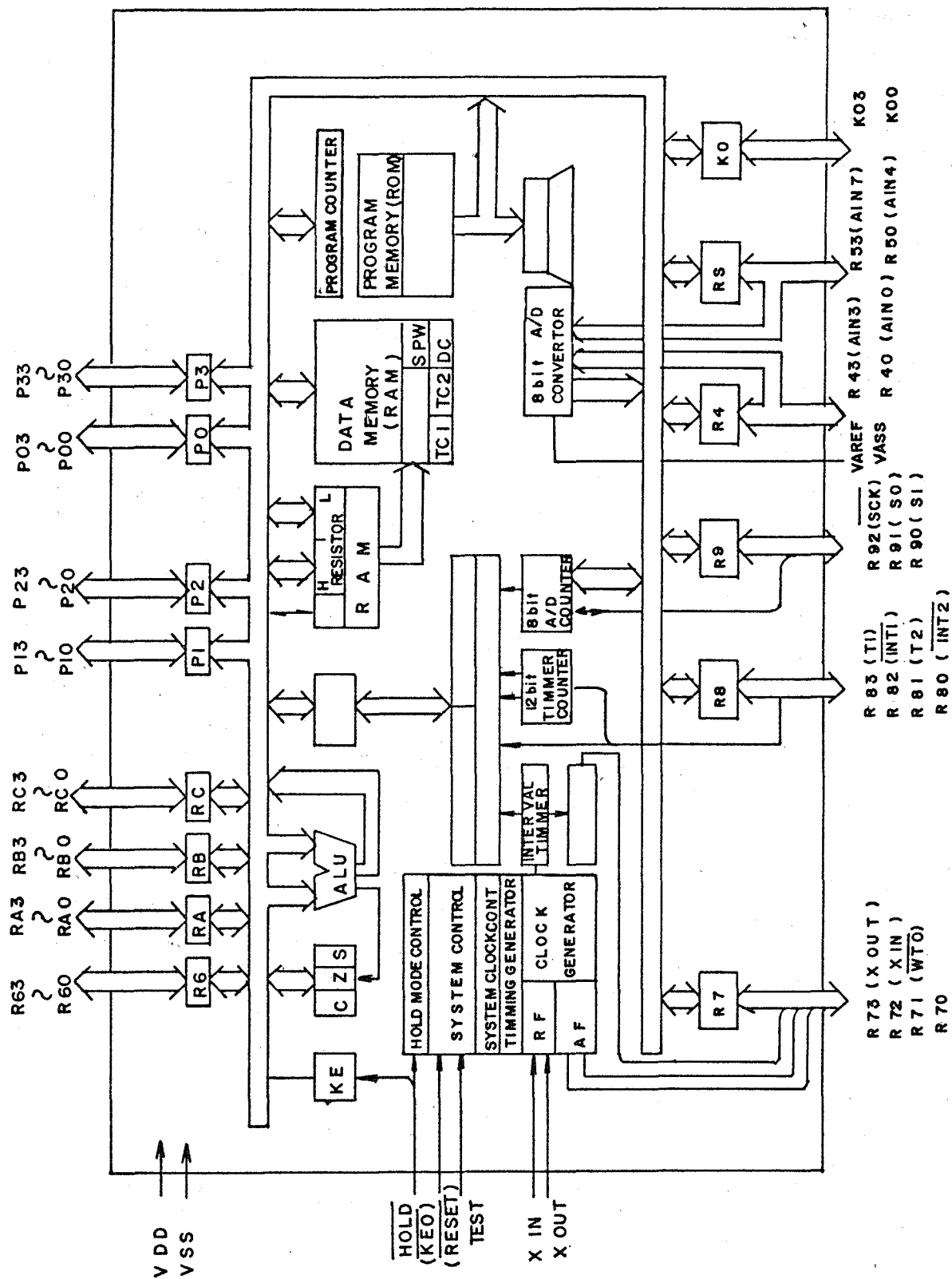


# Circuit Description

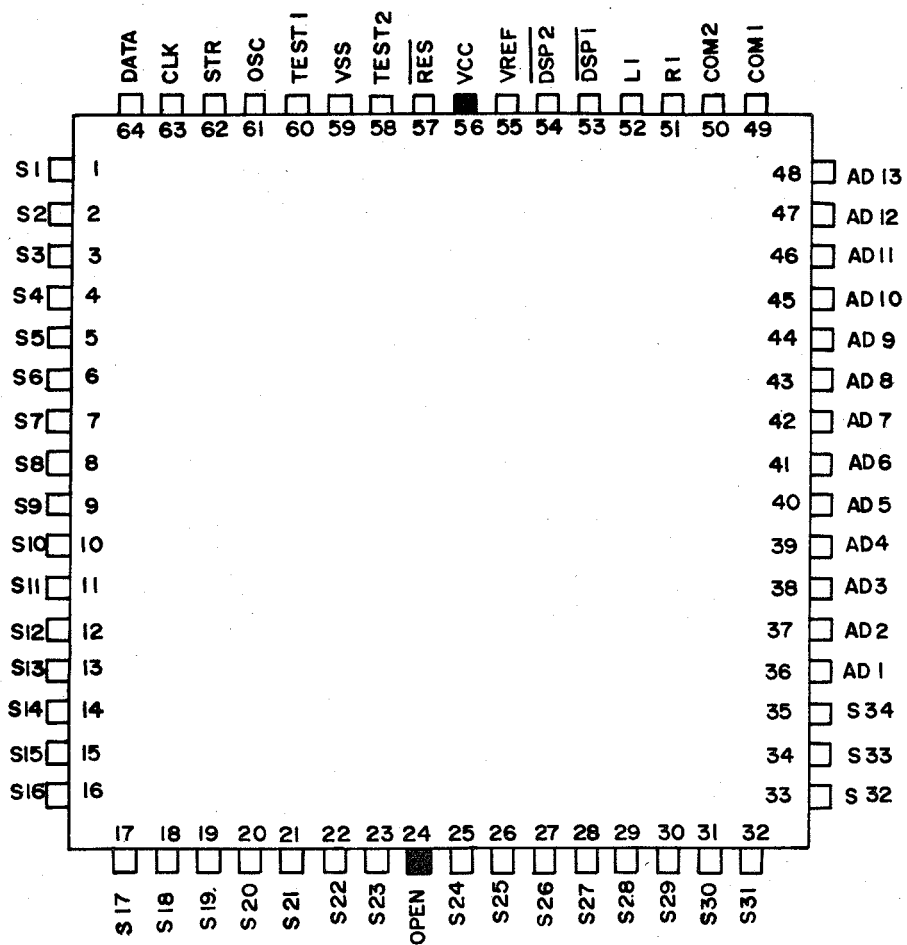
– Pin Assignment(IC 701:DWP 902), Microprocessor



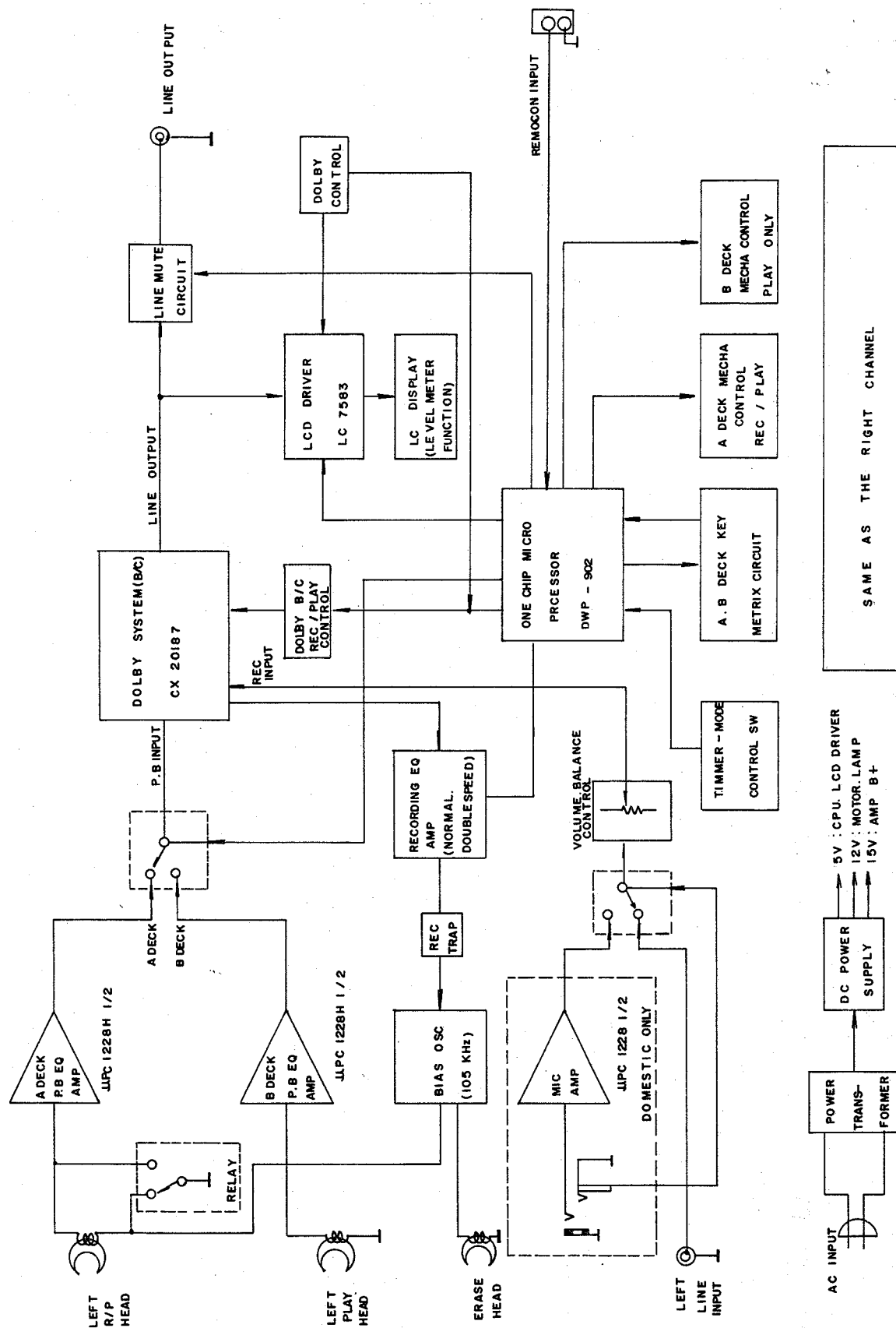
– Internal Block Diagram, DWP 902



–Pin Assignment(IC 901, LC 7583:LCD Driver)



# Block Diagram



# Electrical Parts List

PRODUCT SAFETY NOTE: Products marked with a  $\triangle$  have special characteristics important to safety. If you any of these components, read carefully the product safety notice of this Manual.

RESISTORS and CAPACITORS Tolerance are as follows, D:  $\pm 0.5\%$  J:  $\pm 5\%$  K:  $\pm 10\%$  M:  $\pm 20\%$  Z:  $+80\%$ ,  $-20\%$ .

## MAIN BOARD 4002315900

| Ref. No.            | Parts No.  | Description                     | Position | Remark |
|---------------------|------------|---------------------------------|----------|--------|
| <b>• Capacitors</b> |            |                                 |          |        |
| C101L/R             | 3579561130 | Ceramic 560PF 50V J             | C4/C5    |        |
| C102L/R             | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | C4/C5    |        |
| C103L/R             | 3579221130 | Ceramic 220PF 50V J             | D4/C5    |        |
| C104L/R             | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | D5       |        |
| C105L/R             | 3679682120 | Mylar 0.068 $\mu$ F 100V J      | D5       |        |
| C106L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | D5       |        |
| C107L/R             | 3679153120 | Mylar 0.015 $\mu$ F 100V J      | D5       |        |
| C108                | 3479233031 | Electrolytic 33 $\mu$ F 16V M   | D5       |        |
| C109                | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | D4       |        |
| C110                | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | D4       |        |
| C111                | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | D4       |        |
| C112                | 3479222871 | Electrolytic 0.22 $\mu$ F 50V M | D4       |        |
| C113                | 3479222871 | Electrolytic 0.22 $\mu$ F 50V M | D4       |        |
| C114                | 3479222031 | Electrolytic 22 $\mu$ F 16V M   | D4       |        |
| C115                | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | D4       |        |
| C201L/R             | 3579271130 | Ceramic 270PF 50V J             | F4       |        |
| C202L/R             | 3579271130 | Ceramic 270PF 50V J             | F4       |        |
| C203L/R             | 3479233071 | Electrolytic 33 $\mu$ F 16V M   | F4       |        |
| C204L/R             | 3579221130 | Ceramic 220PF 50V J             | F4       |        |
| C205L/R             | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | F4/F5    |        |
| C206L/R             | 3679682120 | Mylar 0.068 $\mu$ F 100V J      | E4       |        |
| C207L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E4       |        |
| C208L/R             | 3679153120 | Mylar 0.015 $\mu$ F 100V J      | E4       |        |
| C209                | 3479233031 | Electrolytic 33 $\mu$ F 16V M   | E4       |        |
| C210                | 3479210071 | Electrolytic 10 $\mu$ F 50V M   | F5       | KS     |
| C211                | 3479210061 | Electrolytic 10 $\mu$ F 35V M   | F5       | KS     |
| C212                | 3479233031 | Electrolytic 33 $\mu$ F 16V M   | F5       | KS     |
| C213                | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | F5       | KS     |
| C214                | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | F5       | KS     |
| C215                | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | F5       | KS     |
| C216                | 3579330130 | Ceramic 33PF 50V J              | F5       | KS     |
| C217                | 3579222130 | Ceramic 220PF 50V J             | F5       | KS     |
| C301L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E3       |        |
| C302L/R             | 3479210071 | Electrolytic 10 $\mu$ F 50V M   | E3/F3    |        |
| C303L/R             | 3679102120 | Mylar 0.001 $\mu$ F 100V J      | E3/F3    |        |
| C304L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E3/F3    |        |
| C305L/R             | 3479222971 | Electrolytic 2.2 $\mu$ F 50V M  | E3/F3    |        |
| C306L/R             | 3579561130 | Ceramic 560PF 50V J             | E3/F3    |        |
| C307L/R             | 3679472120 | Mylar 0.004 $\mu$ F 100V J      | E3/F3    |        |
| C308L/R             | 3409222121 | Electrolytic 220 $\mu$ F 10V M  | E2/F2    |        |
| C309L/R             | 3679332120 | Mylar 0.0033 $\mu$ F 100V J     | E3/F3    |        |
| C310L/R             | 3679272120 | Mylar 0.0027 $\mu$ F 100V J     | E2/F2    |        |
| C311L/R             | 3479215871 | Electrolytic 0.15 $\mu$ F 50V M | E2/F2    |        |
| C312L/R             | 3479222871 | Electrolytic 0.22 $\mu$ F 50V M | E2/F2    |        |
| C313L/R             | 3679683120 | Mylar 0.068 $\mu$ F 100V J      | E2/F2    |        |
| C314L/R             | 3679473120 | Mylar 0.047 $\mu$ F 100V J      | E2/F2    |        |
| C315L/R             | 3679103120 | Mylar 0.01 $\mu$ F 100V J       | E2/F2    |        |
| C316L/R             | 3679682120 | Mylar 0.068 $\mu$ F 100V J      | E2/F2    |        |
| C317L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E2/F2    |        |
| C318L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E2       |        |
| C319L/R             | 3479247871 | Electrolytic 0.47 $\mu$ F 50V M | E2/F2    |        |
| C320L/R             | 3679153120 | Mylar 0.015 $\mu$ F 100V J      | E2/F2    |        |
| C321                | 3479210071 | Electrolytic 10 $\mu$ F 50V M   | C5       |        |
| C322L/R             | 3679102120 | Mylar 0.001 $\mu$ F 100V J      | D3/F2    |        |
| C323                | 3479233031 | Electrolytic 33 $\mu$ F 16V M   | E3       |        |
| C324                | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E3       |        |
| C401L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | D2/D1    |        |
| C402L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | D3/D1    |        |
| C403L/R             | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | D3/D1    |        |
| C404L/R             | 3679273120 | Mylar 0.027 $\mu$ F 100V J      | D3/D1    |        |
| C405L/R             | 3479233031 | Electrolytic 33 $\mu$ F 16V M   | D2/D1    |        |
| C406L/R             | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | D2/D1    |        |
| C407L/R             | 3679273120 | Mylar 0.027 $\mu$ F 100V J      | D2/D1    |        |
| C408L/R             | 3679273120 | Mylar 0.027 $\mu$ F 100V J      | D2/D1    |        |
| C409L/R             | 3679393120 | Mylar 0.039 $\mu$ F 100V J      | D2/D1    |        |
| C410L/R             | 3679473120 | Mylar 0.047 $\mu$ F 100V J      | D2/D1    |        |
| C411L/R             | 3679273120 | Mylar 0.027 $\mu$ F 100V J      | D2/D1    |        |
| C412L/R             | 3679123120 | Mylar 0.012 $\mu$ F 100V J      | C2/C1    |        |
| C413L/R             | 3679333120 | Mylar 0.033 $\mu$ F 100V J      | C2/C1    |        |
| C414L/R             | 3679183120 | Mylar 0.018 $\mu$ F 100V J      | C2/C1    |        |
| C415L/R             | 3679153120 | Mylar 0.015 $\mu$ F 100V J      | C2/C1    |        |
| C416L/R             | 3679203120 | Mylar 0.02 $\mu$ F 100V J       | C3/C1    |        |

| Ref. No.        | Parts No.  | Description                     | Position | Remark |
|-----------------|------------|---------------------------------|----------|--------|
| C441L/R         | 3579471130 | Ceramic 470PF 50V J             | C5       |        |
| C442            | 3679222130 | Mylar 0.0022 $\mu$ F 160V J     | C5       |        |
| C443            | 3479210061 | Electrolytic 10 $\mu$ F 35V M   | C5       |        |
| C444            | 3679103120 | Mylar 0.01 $\mu$ F 100V J       | D5       |        |
| C445            | 3679562120 | Mylar 0.0056 $\mu$ F 100V J     | D5       |        |
| C446            | 3679562120 | Mylar 0.0056 $\mu$ F 100V J     | D5       |        |
| C447            | 3679103120 | Mylar 0.01 $\mu$ F 100V J       | D5       |        |
| C501L/R         | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | E1       |        |
| C502L/R         | 3479247971 | Electrolytic 4.7 $\mu$ F 50V M  | E1       |        |
| C601            | 3409210261 | Electrolytic 1000 $\mu$ F 35V M | A1       |        |
| C602            | 3409210233 | Electrolytic 1000 $\mu$ F 16V M | B1       |        |
| C603            | 3579561130 | Ceramic 560PF 50V J             | A3       |        |
| C604            | 3579561130 | Ceramic 560PF 50V J             | A3       |        |
| C605            | 3409210233 | Electrolytic 1000 $\mu$ F 16V M | A2       |        |
| C606            | 3579561130 | Ceramic 560PF 50V J             | A3       |        |
| C701            | 3529200210 | Ceramic CH 20PF 50V J           | B4       |        |
| C702            | 3529200210 | Ceramic CH 20PF 50V J           | B4       |        |
| C703            | 3479210971 | Electrolytic 1 $\mu$ F 50V M    | C4       |        |
| C704            | 3579561130 | Ceramic 560PF 50V J             | A4       |        |
| <b>• Coils</b>  |            |                                 |          |        |
| L301 L/R        | 2658301120 | Mpx Filter                      | E3/F3    |        |
| L302 L/R        | 2648601710 | Inductor 21mH                   | E2/F2    |        |
| L401 L/R        | 2648601140 | Inductor 3.5mH                  | D2/D1    |        |
| L402 L/R        | 2648601130 | Inductor 2.5mH                  | D2/D1    |        |
| L403 L/R        | 2648601140 | Inductor 3.5mH                  | D2/D1    |        |
| L404 L/R        | 2648601040 | Inductor 2mH                    | C2/C1    |        |
| L405 L/R        | 2648601040 | Inductor 2mH                    | C2/C1    |        |
| L406 L/R        | 2648601040 | Inductor 2mH                    | C2/C1    |        |
| L441 L/R        | 2668501080 | Rec Trap                        | C5       |        |
| L443            | 2638601150 | Bias osc                        | C5       |        |
| <b>• Diodes</b> |            |                                 |          |        |
| D101            | 2258106100 | 1N 4002                         | C5       |        |
| D105            | 2058306101 | 1N 4148                         | C3       |        |
| D106            | 2058306101 | 1N 4148                         | C3       |        |
| D107            | 2058306101 | 1N 4148                         | F3       |        |
| D108            | 2058306101 | 1N 4148                         | F3       |        |
| D109            | 2058306101 | 1N 4148                         | F3       |        |
| D501L/R         | 2058306101 | 1N 4148                         | E1       |        |
| D601            | 2258106100 | 1N 4002                         | A2       |        |
| D602            | 2258106100 | 1N 4002                         | A1       |        |
| D603            | 2258106100 | 1N 4002                         | A1       |        |
| D604            | 2258106100 | 1N 4002                         | A1       |        |
| D605            | 2258106100 | 1N 4002                         | B1       |        |
| D607            | 2058599116 | Zener 12V                       | B1       |        |
| D608            | 2058599104 | Zener 5.6V                      | B2       |        |
| D610            | 2058306101 | 1N 4148                         | A2       |        |
| D612            | 2058306101 | 1N 4148                         | C2       |        |
| D613            | 2058306101 | 1N 4148                         | C1       |        |
| D614            | 2058306101 | 1N 4148                         | C1       |        |
| D701            | 2058306101 | 1N 4148                         | B3       |        |
| D702            | 2058306101 | 1N 4148                         | B4       |        |
| D703            | 2058306101 | 1N 4148                         | B4       |        |
| D704            | 2258106100 | 1N 4002                         | B4       |        |
| D705            | 2058306101 | 1N 4148                         | B5       |        |
| D706            | 2058306101 | 1N 4148                         | B5       |        |
| D707            | 2058306101 | 1N 4148                         | A3       |        |
| D708            | 2058306101 | 1N 4148                         | A3       |        |
| D709            | 2058306101 | 1N 4148                         | A4       |        |
| D710            | 2058306101 | 1N 4148                         | A4       |        |
| D711            | 2258106100 | 1N 4002                         | A5       |        |
| <b>• ICs</b>    |            |                                 |          |        |
| IC101           | 2168013105 | $\mu$ PC 1228H                  | D4       |        |
| IC102           | 2138009101 | MC 14066                        | D5       |        |
| IC103           | 2168022105 | BA 336                          | D5       |        |
| IC201           | 2168013105 | $\mu$ PC 1228H                  | F4       |        |
| IC202           | 2168013105 | $\mu$ PC 1228H                  | F5       |        |
| IC301           | 2168000108 | CX 20187                        | E2       |        |
| IC601           | 2168601105 | GD 7815                         | B1       |        |



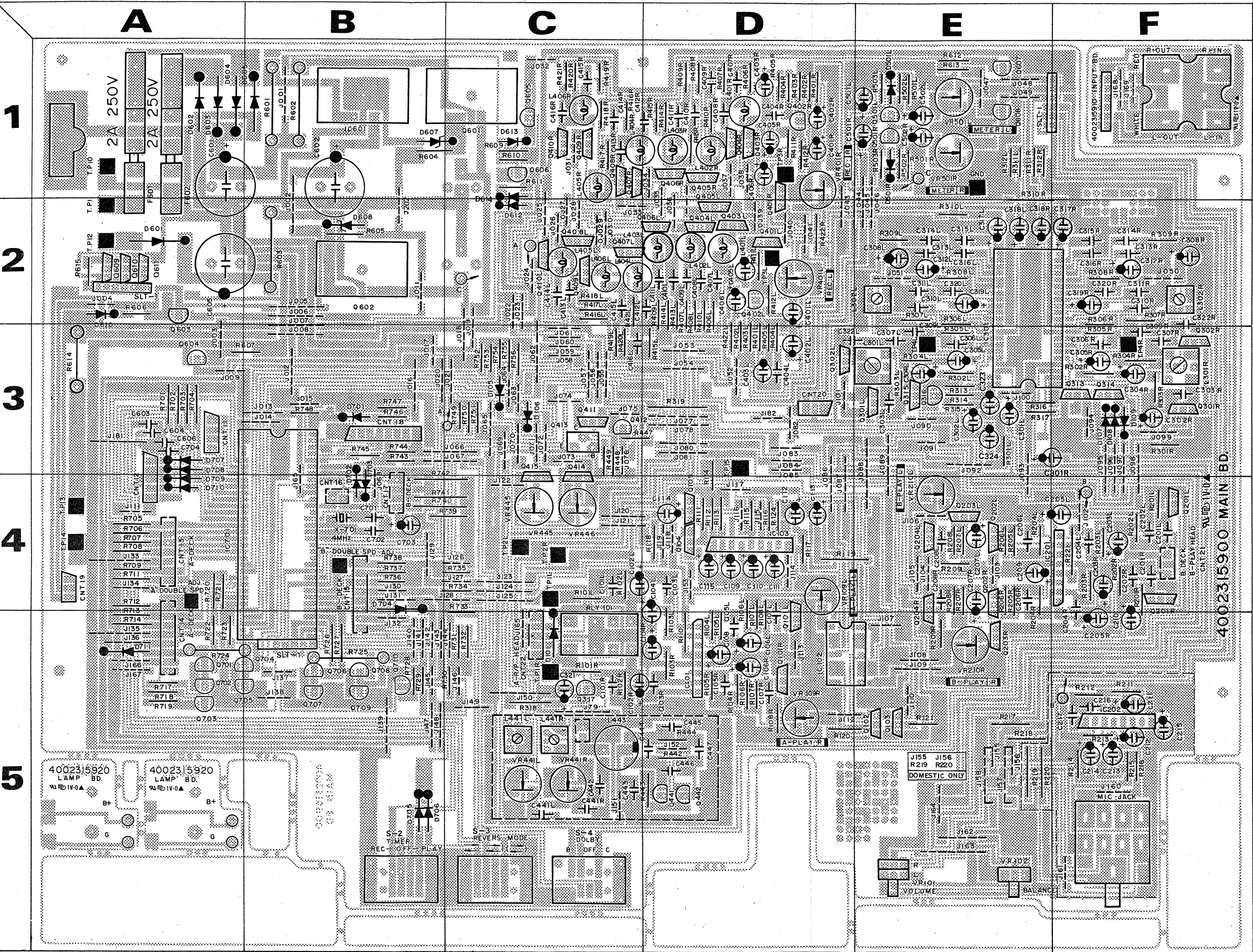
| Ref. No.    | Parts No.  | Description                        | Position | Remark |
|-------------|------------|------------------------------------|----------|--------|
| IC701       | 2138307122 | TMP 47P 860N                       | B4       |        |
| X701        | 3908101140 | X-TAL 4MHz                         | B4       |        |
| • Relay     |            |                                    |          |        |
| RLY101      | 5528011020 | Relay RX-12W-K                     | C5       |        |
| • Resistors |            |                                    |          |        |
| R101L/R     | 3069100970 | Carbon Film 10 $\frac{1}{8}$ W J   | C4/C5    |        |
| R102L/R     | 3069104970 | Carbon Film 100K $\frac{1}{8}$ W J | C4/C5    |        |
| R103L/R     | 3069121970 | Carbon Film 120 $\frac{1}{8}$ W J  | D5       |        |
| R104L/R     | 3069243970 | Carbon Film 24K $\frac{1}{8}$ W J  | D5       |        |
| R105L/R     | 3069474970 | Carbon Film 470K $\frac{1}{8}$ W J | D5       |        |
| R106L/R     | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | D5       |        |
| R107L/R     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | D5       |        |
| R108        | 3069104970 | Carbon Film 100K $\frac{1}{8}$ W J | D5       |        |
| R110        | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | D5       |        |
| R111        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | D4       |        |
| R112        | 3069394970 | Carbon Film 390K $\frac{1}{8}$ W J | D4       |        |
| R113        | 3069394970 | Carbon Film 390K $\frac{1}{8}$ W J | D4       |        |
| R114        | 3069471970 | Carbon Film 470K $\frac{1}{8}$ W J | D4       |        |
| R115        | 3069562970 | Carbon Film 5.6K $\frac{1}{8}$ W J | D4       |        |
| R116        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | D4       |        |
| R117        | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | D4       |        |
| R118        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | D4       |        |
| R119        | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | D4       |        |
| R120        | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | D5       |        |
| R121        | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | E5       |        |
| R124        | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | D4       |        |
| R201L/R     | 3069224970 | Carbon Film 220K $\frac{1}{8}$ W J | F4       |        |
| R202L/R     | 3069224970 | Carbon Film 220K $\frac{1}{8}$ W J | F4       |        |
| R203L/R     | 3069121970 | Carbon Film 120 $\frac{1}{8}$ W J  | F4       |        |
| R204L/R     | 3069474970 | Carbon Film 470K $\frac{1}{8}$ W J | E4       |        |
| R205L/R     | 3069822970 | Carbon Film 8.2K $\frac{1}{8}$ W J | E4       |        |
| R206L/R     | 3069123970 | Carbon Film 12K $\frac{1}{8}$ W J  | E4       |        |
| R207L/R     | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | E4       |        |
| R208L/R     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | D4       |        |
| R209L/R     | 3069104970 | Carbon Film 100K $\frac{1}{8}$ W J | E4/E5    |        |
| R211        | 3069152970 | Carbon Film 1.5K $\frac{1}{8}$ W J | F5       | KS     |
| R212        | 3069394970 | Carbon Film 390K $\frac{1}{8}$ W J | F5       | KS     |
| R213        | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | F5       | KS     |
| R214        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | F5       | KS     |
| R215        | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | F5       | KS     |
| R216        | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | F5       | KS     |
| R217        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E5       |        |
| R218        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E5       |        |
| R219        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E5       |        |
| R220        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E5       |        |
| R221        | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | F4       |        |
| R301L/R     | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | E3/F3    |        |
| R302L/R     | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | E3/F3    |        |
| R303L/R     | 3069682970 | Carbon Film 6.8K $\frac{1}{8}$ W J | E3/F3    |        |
| R304L/R     | 3069752970 | Carbon Film 7.5K $\frac{1}{8}$ W J | E3/F3    |        |
| R305L/R     | 3069471970 | Carbon Film 470 $\frac{1}{8}$ W J  | E3/F3    |        |
| R306L/R     | 3069562970 | Carbon Film 5.6K $\frac{1}{8}$ W J | E3/F3    |        |
| R307L/R     | 3069272970 | Carbon Film 2.7K $\frac{1}{8}$ W J | F2/F1    |        |
| R308L/R     | 3069682970 | Carbon Film 6.8K $\frac{1}{8}$ W J | E2/F2    |        |
| R309L/R     | 3069681970 | Carbon Film 680 $\frac{1}{8}$ W J  | E2/F2    |        |
| R310L/R     | 3069152970 | Carbon Film 1.5K $\frac{1}{8}$ W J | E2/E1    |        |
| R311L/R     | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | E1       |        |
| R312L/R     | 3069562970 | Carbon Film 5.6K $\frac{1}{8}$ W J | E1       |        |
| R313        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E3       |        |
| R314        | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | E3       |        |
| R315        | 3069682970 | Carbon Film 6.8K $\frac{1}{8}$ W J | E3       |        |
| R316        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | E3       |        |
| R317        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | E3       |        |
| R318        | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | C5       |        |
| R319        | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | D3       |        |
| R401L/R     | 3069393970 | Carbon Film 39K $\frac{1}{8}$ W J  | D3/D1    |        |
| R402L/R     | 3069822970 | Carbon Film 8.2K $\frac{1}{8}$ W J | D3/D1    |        |
| R403L/R     | 3069224970 | Carbon Film 220K $\frac{1}{8}$ W J | D3/D1    |        |
| R404L/R     | 3069182970 | Carbon Film 1.8K $\frac{1}{8}$ W J | D3/D1    |        |
| R405L/R     | 3069242970 | Carbon Film 2.4K $\frac{1}{8}$ W J | D3/D1    |        |
| R406L/R     | 3069560970 | Carbon Film 56 $\frac{1}{8}$ W J   | D2/D1    |        |
| R407L/R     | 3069150970 | Carbon Film 15 $\frac{1}{8}$ W J   | D2/D1    |        |
| R408L/R     | 3069682970 | Carbon Film 6.8K $\frac{1}{8}$ W J | D2/D1    |        |
| R409L/R     | 3069820970 | Carbon Film 82 $\frac{1}{8}$ W J   | D2/D1    |        |
| R410L/R     | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | D2/D1    |        |
| R411L/R     | 3069122970 | Carbon Film 1.2K $\frac{1}{8}$ W J | D2/D1    |        |
| R412L/R     | 3069681970 | Carbon Film 680 $\frac{1}{8}$ W J  | D2/D1    |        |

| Ref. No. | Parts No.  | Description                        | Position | Remark |
|----------|------------|------------------------------------|----------|--------|
| R413L/R  | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | D2/D1    |        |
| R414L/R  | 3069392970 | Carbon Film 3.9K $\frac{1}{8}$ W J | D2/D1    |        |
| R415L/R  | 3069101970 | Carbon Film 100 $\frac{1}{8}$ W J  | D3/D1    |        |
| R416L/R  | 3069470970 | Carbon Film 47 $\frac{1}{8}$ W J   | C2/C1    |        |
| R417L/R  | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | C2/C1    |        |
| R418L/R  | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | C2/C1    |        |
| R419L/R  | 3069101970 | Carbon Film 100 $\frac{1}{8}$ W J  | C3/C1    |        |
| R420L/R  | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | C3/C1    |        |
| R421L/R  | 3069242970 | Carbon Film 2.4K $\frac{1}{8}$ W J | C2/C1    |        |
| R422L/R  | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | D3/D2    |        |
| R442     | 3069333970 | Carbon Film 33K $\frac{1}{8}$ W J  | D5       |        |
| R443     | 3069100970 | Carbon Film 10 $\frac{1}{8}$ W J   | D5       |        |
| R444     | 3069133970 | Carbon Film 33K $\frac{1}{8}$ W J  | D5       |        |
| R447     | 3069473970 | Carbon Film 47K $\frac{1}{8}$ W J  | C3       |        |
| R448     | 3069821970 | Carbon Film 820 $\frac{1}{8}$ W J  | C3       |        |
| R449     | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | C3       |        |
| R501L/R  | 3069393970 | Carbon Film 39K $\frac{1}{8}$ W J  | E1       |        |
| R502L/R  | 3069183970 | Carbon Film 18K $\frac{1}{8}$ W J  | E1       |        |
| R503L/R  | 3069333970 | Carbon Film 33K $\frac{1}{8}$ W J  | E1       |        |
| R601     | 3039339472 | Metal Oxide 3.3 1W                 | B1       |        |
| R602     | 3039339472 | Metal Oxide 3.3 1W                 | B1       |        |
| R603     | 3039339472 | Metal Oxide 3.3 1W                 | B2       |        |
| R604     | 3069221970 | Carbon Film 220 $\frac{1}{8}$ W J  | B1       |        |
| R605     | 3069221970 | Carbon Film 220 $\frac{1}{8}$ W J  | B2       |        |
| R606     | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | A2       |        |
| R609     | 3069222970 | Carbon Film 2.2K $\frac{1}{8}$ W J | C1       |        |
| R610     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | C1       |        |
| R611     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C1       |        |
| R612     | 3069333970 | Carbon Film 3.3K $\frac{1}{8}$ W J | E1       |        |
| R613     | 3069332970 | Carbon Film 3.3K $\frac{1}{8}$ W J | E1       |        |
| R614     | 3039221472 | Metal Oxide 220 1W                 | A3       |        |
| R615     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A2       |        |
| R701     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A3       |        |
| R702     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A3       |        |
| R703     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A3       |        |
| R704     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A3       |        |
| R705     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R706     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R707     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R708     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R709     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R711     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R712     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A4       |        |
| R713     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A5       |        |
| R714     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A5       |        |
| R717     | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | A5       |        |
| R718     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | A5       |        |
| R719     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | A5       |        |
| R720     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | A4       |        |
| R721     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | A4       |        |
| R722     | 3069471970 | Carbon Film 470 $\frac{1}{8}$ W J  | A5       |        |
| R723     | 3069471970 | Carbon Film 470 $\frac{1}{8}$ W J  | A5       |        |
| R724     | 3039220472 | Metal Oxide 22 1W                  | A5       |        |
| R725     | 3039220472 | Metal Oxide 22 1W                  | B5       |        |
| R726     | 3069471970 | Carbon Film 470 $\frac{1}{8}$ W J  | B5       |        |
| R727     | 3069471970 | Carbon Film 470 $\frac{1}{8}$ W J  | B5       |        |
| R728     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B5       |        |
| R729     | 3069223970 | Carbon Film 22K $\frac{1}{8}$ W J  | B5       |        |
| R730     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | D4       |        |
| R731     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C5       |        |
| R732     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C5       |        |
| R733     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C4       |        |
| R734     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C4       |        |
| R735     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C4       |        |
| R736     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R737     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R738     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R739     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C4       |        |
| R740     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R741     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R742     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B4       |        |
| R743     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B3       |        |
| R744     | 3069103970 | Carbon Film 10K $\frac{1}{8}$ W J  | B3       |        |
| R745     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | B3       |        |
| R746     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | B3       |        |
| R747     | 3069472970 | Carbon Film 4.7K $\frac{1}{8}$ W J | B3       |        |
| R748     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | B3       |        |
| R749     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C3       |        |
| R750     | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J   | C3       |        |

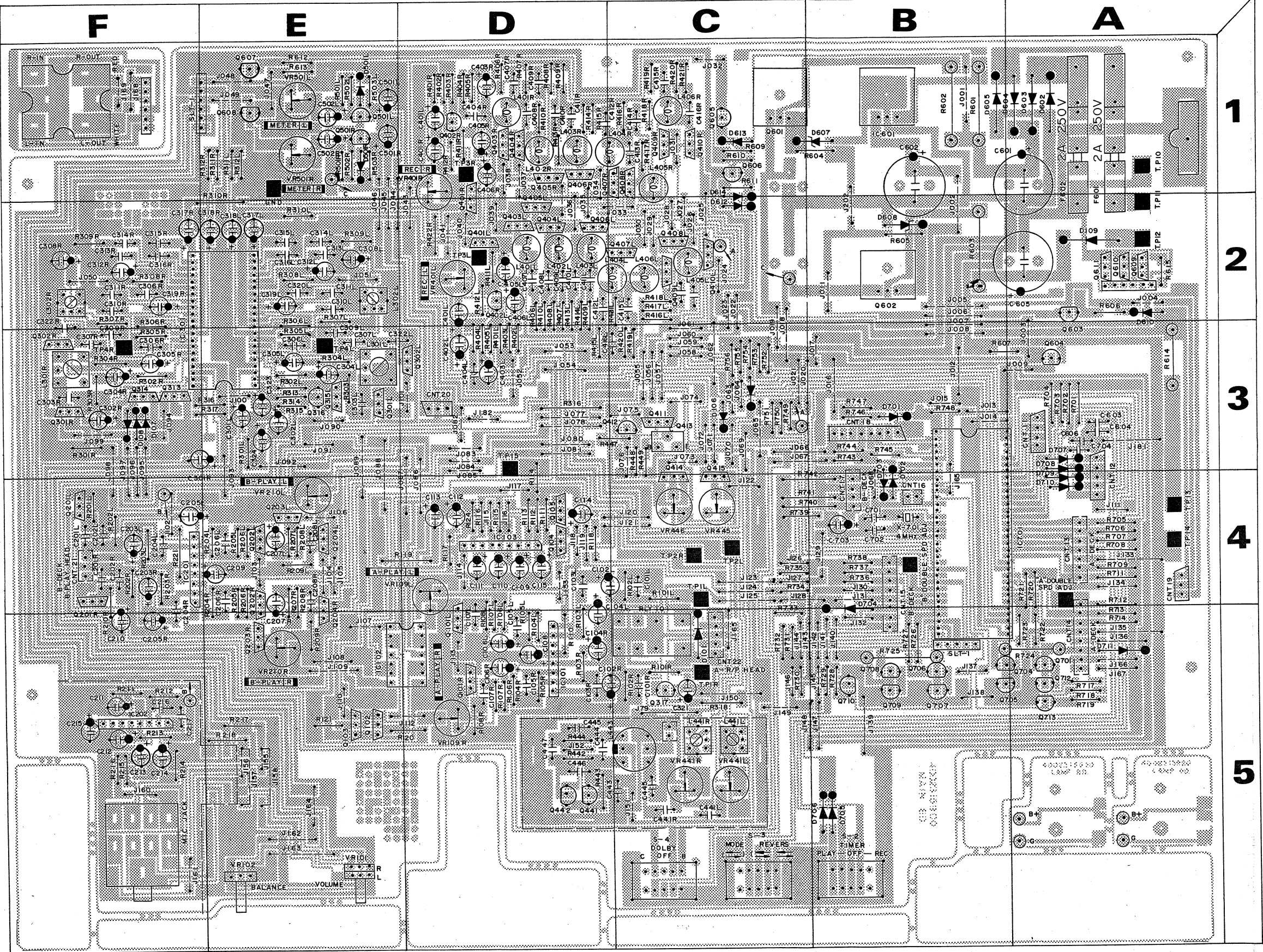
| Ref. No.             | Parts No.  | Description                      | Position | Remark |
|----------------------|------------|----------------------------------|----------|--------|
| R751                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| R752                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| R753                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| R754                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| R755                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| R756                 | 3069102970 | Carbon Film 1K $\frac{1}{8}$ W J | C3       |        |
| • Transistors        |            |                                  |          |        |
| Q101L/R              | 2208622106 | NPN DTC 114YS                    | D5       |        |
| Q102                 | 2208622106 | NPN DTC 114YS                    | E5       |        |
| Q103                 | 2208622106 | NPN DTC 114YS                    | E5       |        |
| Q104                 | 2208622106 | NPN DTC 114YS                    | D4       |        |
| Q105                 | 2208622106 | NPN DTC 114YS                    | D4       |        |
| Q201L/R              | 2208622106 | NPN DTC 114YS                    | F4       |        |
| Q202L/R              | 2208622106 | NPN DTC 114YS                    | E4       |        |
| Q203L/R              | 2208622106 | NPN DTC 114YS                    | E4/E5    |        |
| Q204L/R              | 2208622106 | NPN DTC 114YS                    | E4       |        |
| Q301L/R              | 2208622106 | NPN DTC 114YS                    | E3/F3    |        |
| Q302L/R              | 2208622106 | NPN DTC 114YS                    | D3/F3    |        |
| Q313                 | 2208622106 | NPN DTC 114YS                    | F3       |        |
| Q314                 | 2208622106 | NPN DTC 114YS                    | F3       |        |
| Q315                 | 2208622106 | NPN DTC 114YS                    | E3       |        |
| Q316                 | 2208606104 | NPN KTC 1815Y                    | E3       |        |
| Q317                 | 2208609101 | NPN MPS A05                      | C5       |        |
| Q401L/R              | 2208606106 | NPN DTC 114YS                    | D2/D1    |        |
| Q402L/R              | 2208606104 | NPN KTC 1815Y                    | D2/D1    |        |
| Q403L/R              | 2208622106 | NPN DTC 114YS                    | D2/D1    |        |
| Q404L/R              | 2208622106 | NPN DTC 114YS                    | D2/D1    |        |
| Q405L/R              | 2208622106 | NPN DTC 114YS                    | D2/D1    |        |
| Q406L/R              | 2208622106 | NPN DTC 114YS                    | D2/D1    |        |
| Q407L/R              | 2208622106 | NPN DTC 114YS                    | C2/C1    |        |
| Q408L/R              | 2208622106 | NPN DTC 114YS                    | C2/C1    |        |
| Q409L/R              | 2208622106 | NPN DTC 114YS                    | C2/C1    |        |
| Q410                 | 2208622106 | NPN DTC 114YS                    | C2/C1    |        |
| Q411                 | 2208622106 | NPN DTC 114YS                    | C3       |        |
| Q412                 | 2208209106 | DNP MPS A56                      | C3       |        |
| Q413                 | 2208406113 | NPN KTD 880                      | C3       |        |
| Q414                 | 2208622106 | NPN KTC 114YS                    | C4       |        |
| Q415                 | 2208622106 | NPN KTC 114YS                    | C4       |        |
| Q501L/R              | 2208606104 | NPN KTC 1815Y                    | E1       |        |
| Q601                 | 2208406113 | NPN KTD 880                      | C1       |        |
| Q602                 | 2208406113 | NPN KTD 880                      | B2       |        |
| Q603                 | 2208622107 | NPN 2SC 1740S                    | A2       |        |
| Q604                 | 2208622106 | NPN KTC 114YS                    | A3       |        |
| Q605                 | 2208609101 | NPN MPS A05                      | C1       |        |
| Q606                 | 2208606104 | NPN KTC 1815Y                    | C1       |        |
| Q607                 | 2208610102 | NPN 2SD 1302S                    | E1       |        |
| Q608                 | 2208610102 | NPN 2SD 1302S                    | E1       |        |
| Q609                 | 2208622106 | NPN KTC 114YS                    | A2       |        |
| Q610                 | 2208622106 | NPN KTC 114YS                    | A2       |        |
| Q611                 | 2208622106 | NPN KTC 114YS                    | A2       |        |
| Q701                 | 2208606104 | NPN KTC 1815Y                    | A5       |        |
| Q702                 | 2208606104 | NPN KTC 1815Y                    | A5       |        |
| Q703                 | 2208606104 | NPN KTC 1815Y                    | A5       |        |
| Q704                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q705                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q706                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q707                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q708                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q709                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| Q710                 | 2208606104 | NPN KTC 1815Y                    | B5       |        |
| • Variable Resistors |            |                                  |          |        |
| VR109L/R             | 3248322320 | Semi 22K(B)                      | D4/D5    |        |
| VR210L/R             | 3248322320 | Semi 22K(B)                      | E4/E5    |        |
| VR401L/R             | 3248322320 | Semi 22K(B)                      | D1/D2    |        |
| VR441L/R             | 3248310420 | Semi 100K(B)                     | C5       |        |
| VR445                | 3248322320 | Semi 22K(B)                      | C4       |        |
| VR446                | 3248310320 | Semi 10K(B)                      | C4       |        |
| VR501L/R             | 3248310320 | Semi 10K(B)                      | E1       |        |

Top & Bottom View of P.C Boards

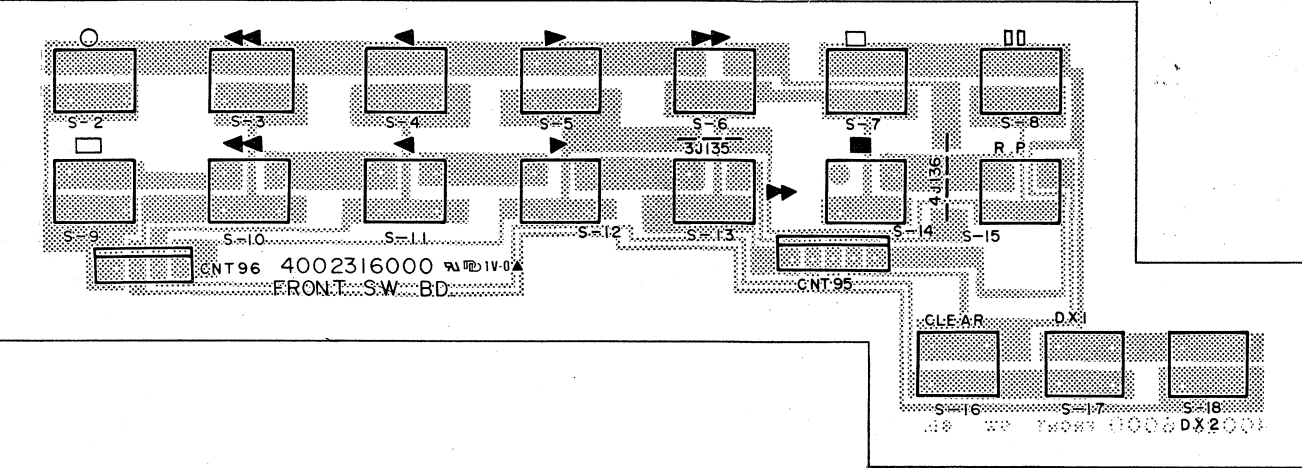
MAIN BOARD 4002315900 -TOP VIEW



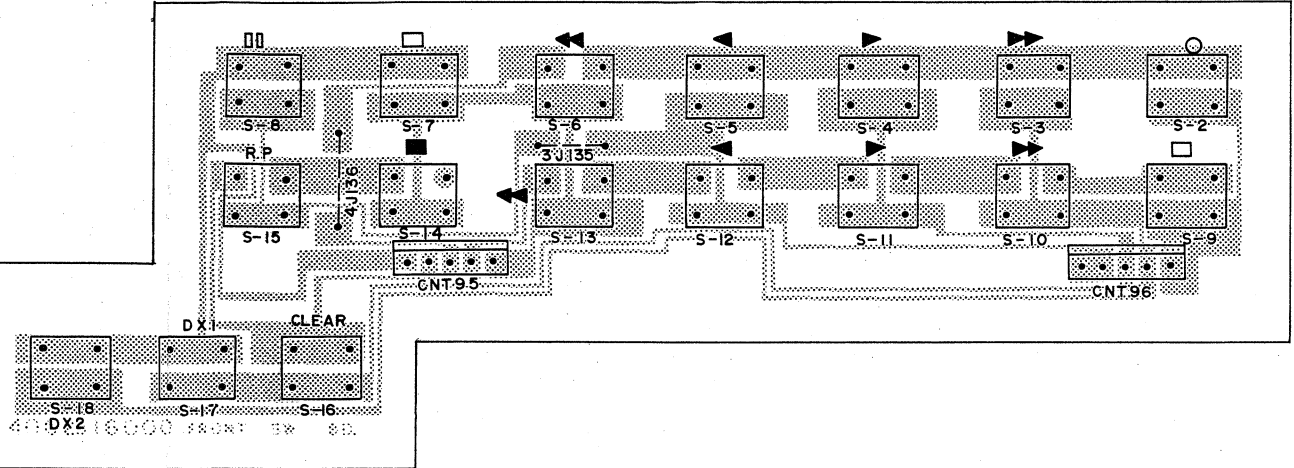




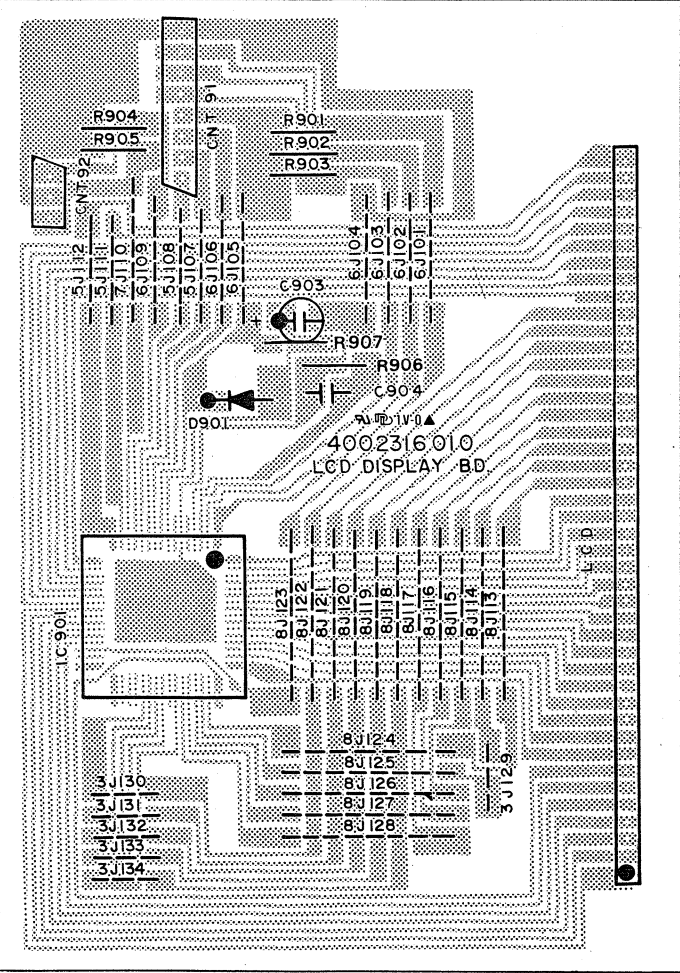
FRONT SW BOARD 4002316000  
- TOP VIEW



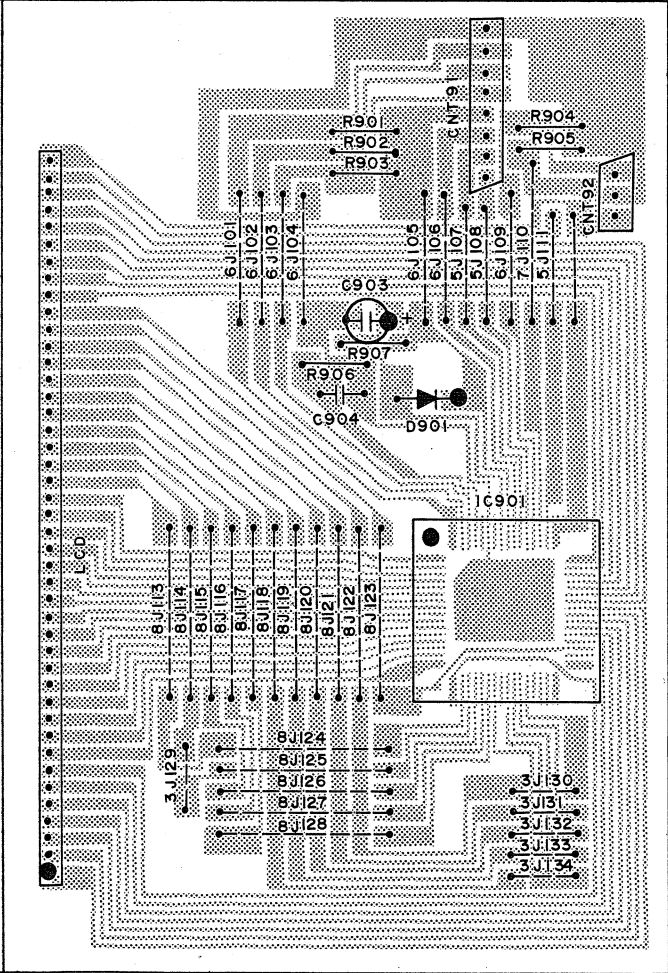
- BOTTOM VIEW



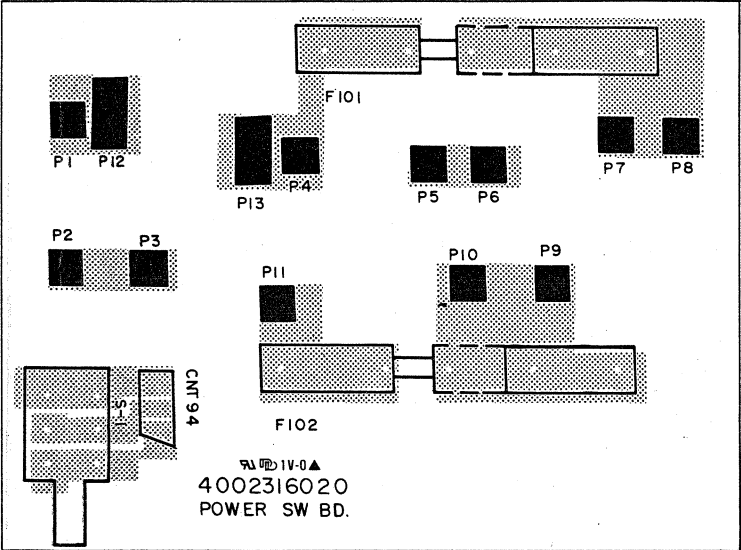
LCD DISPLAY BOARD 4002316010  
- TOP VIEW



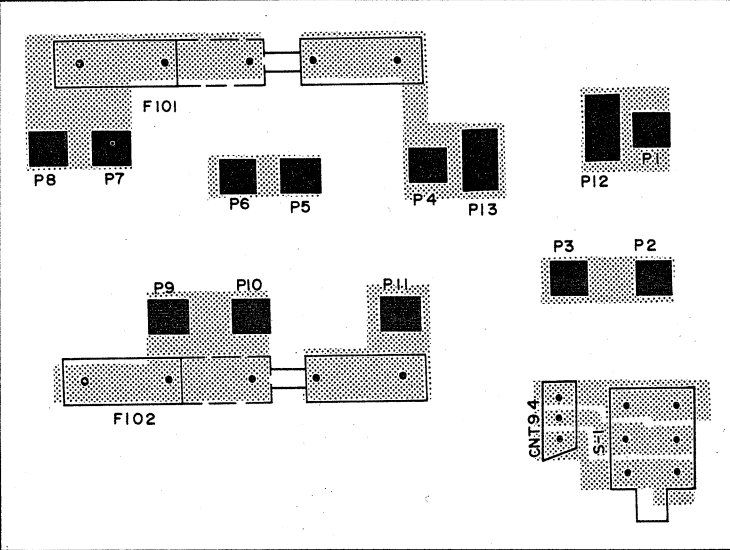
- BOTTOM VIEW



POWER SW BOARD  
- TOP VIEW



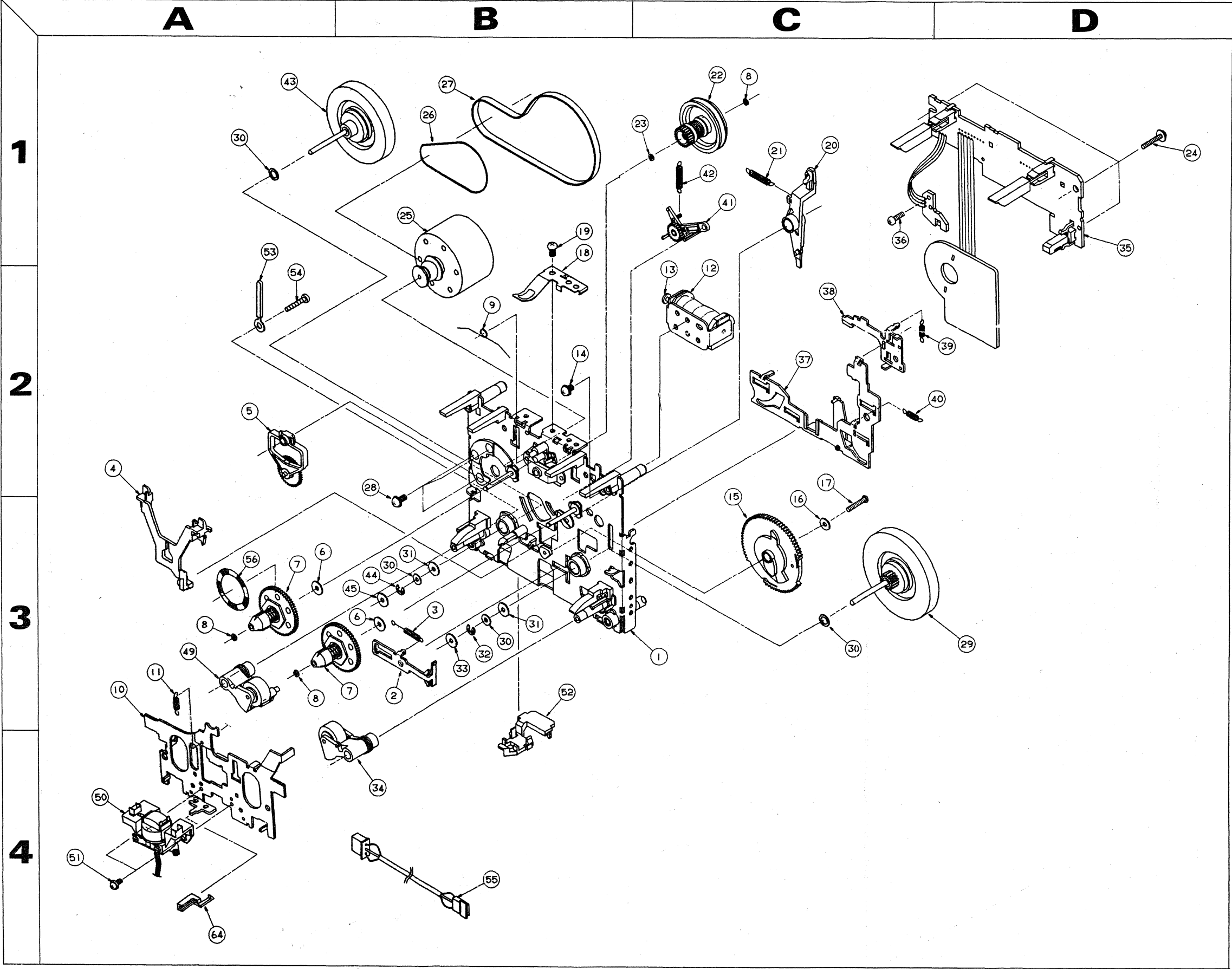
- BOTTOM VIEW



Parts List & Exploded View of Deck Mechanism (I)

| No. | Part No.   | Description |                             | Q'ty | Remark |
|-----|------------|-------------|-----------------------------|------|--------|
|     |            | Parts Code  | Parts Name                  |      |        |
| 1   | 5708903700 | F112-118    | Ass'y Chassis               | 1    |        |
| 2   | 5708903710 | FC48R-25    | Cam Gear                    | 1    |        |
| 3   | 5708903720 | FK26H-13    | Spring Gear Cam SP          | 1    |        |
| 4   | 5708903730 | FD40K-26    | Lever Hold                  | 1    |        |
| 5   | 5708903740 | F017-048    | Ass'y Idler                 | 1    |        |
| 6   | 5708903750 | UJ12V-11    | Poly Slider 2.1×0.25 T      | 2    |        |
| 7   | 5708903760 | F105-027    | Ass'y Reel                  | 2    |        |
| 8   | 5708903770 | FJ111-17    | Poly Slider 1.7×0.25        | 3    |        |
| 9   | 5708903780 | FK26R-12    | Spring Hold SP              | 1    |        |
| 10  | 5708903790 | FC48U-31    | Ass'y Head Plate            | 1    |        |
| 11  | 5708903800 | FK26N-14    | Spring Head Base            | 1    |        |
| 12  | 5708903810 | F265-252    | Ass'y Solenoid PKA 16145/AY | 1    |        |
| 13  | 5708903820 | PL366-11    | Plunger                     | 1    |        |
| 14  | 5708903830 | UG11S-14    | Screw 2.6×3.5 ZN            | 1    |        |
| 15  | 5708903840 | FD40M-27    | Cam Gear(s)                 | 1    |        |
| 16  | 5708903850 | MJ112-22    | Washer 2.0 ZN               | 1    |        |
| 17  | 5708903860 | UG12H-20    | Screw 2.0×13 ZNT            | 1    |        |
| 18  | 5708903870 | FC49E-12    | Spring Cassete Pushing      | 1    |        |
| 19  | 5708903880 | KG194-29    | Screw TT 2.6×5 ZN           | 1    |        |
| 20  | 5708903890 | FD40L-22    | Arm Play                    | 1    |        |
| 21  | 5708903900 | FK22G-11    | Spring Arm Play             | 1    |        |
| 22  | 5708903910 | FR20V-11    | Ass'y Clutch                | 1    |        |
| 23  | 5708903920 | FJ111-19    | Poly Slider 2.1×0.13        | 1    |        |
| 24  | 5708903930 | UG15U-11    | Screw 2×13                  | 3    |        |
| 25  | 5708903940 | F064-250    | Ass'y Motor                 | 1    |        |
| 26  | 5708903950 | FF17H-13A   | Belt Sub.                   | 1    |        |
| 27  | 5708903960 | FF17G-11    | Belt Main                   | 1    |        |
| 28  | 5708903970 | FG114-14    | Screw 2.6×5 ZN              | 3    |        |
| 29  | 5708903980 | FR21E-14C   | Ass'y Flywheel 2.5          | 1    |        |
| 30  | 5708903990 | FJ111-30    | Poly Slider 2.6×0.25        | 4    |        |
| 31  | 5708904000 | UJ13V-11    | Poly Slider 2.6×0.25 T      | 2    |        |
| 32  | 5708904010 | UG13U-12    | E Ring                      | 1    |        |
| 33  | 5708904020 | FJ141-11    | Washer Oil Seal 2.4×0.25 T  | 1    |        |
| 34  | 5708904030 | FR20W-11    | Ass'y Pinch Roller 2.5      | 1    |        |
| 35  | 5708904040 | F062-155    | Ass'y Sensor B'D            | 1    |        |
| 36  | 5708904050 | UG12H-26    | Screw 2×6                   | 1    |        |
| 37  | 5708904060 | FC48T-24    | Ass'y Slide Plate           | 1    |        |
| 38  | 5708904070 | FC48S-22    | Plate Control               | 1    |        |
| 39  | 5708904080 | FK26M-13    | Spring Plate Control        | 1    |        |
| 40  | 5708904090 | FK26P-12    | Spring Slide                | 1    |        |
| 41  | 5708904100 | F120-017    | Ass'y Gear Arm              | 1    |        |
| 42  | 5708904110 | FK26K-12    | Spring Revrse Gear          | 1    |        |
| 43  | 5708904120 | FR20U-15    | Ass'y FLY Wheel 2.2         | 1    |        |
| 44  | 5708904130 | UG13U-15    | E Ring                      | 1    |        |
| 45  | 5708904140 | FJ141-14    | Washer Oil Seal             | 1    |        |
| 46  | 5708904150 |             | Not used!                   |      |        |
| 47  | 5708904160 |             | Not used!                   |      |        |
| 48  | 5708904170 |             | Not used!                   |      |        |
| 49  | 5708904180 | FR20Y-11    | Ass'y Pinch Roller 2.2      | 1    |        |
| 50  | 5708904190 | F257-162    | Ass'y Rotary Head           | 1    |        |
| 51  | 5708904200 | KG194-35    | Screw 2.0×5 ZN              | 2    |        |
| 52  | 5708904210 | FD41U-25    | Lead Holder                 | 1    |        |
| 53  | 5708904220 | UH11Y-11    | LUG                         | 1    |        |
| 54  | 5708904230 | UG12H-14    | Screw 2.6×8                 | 1    |        |
| 55  | 5708904240 | WH48H-15    | Ass'y Connector             | 1    |        |
| 56  | 5708904250 | UT18G-15    | Plate Reflector             | 1    |        |
| 64  | 5708904260 | FD44F-11    | Protector                   | 1    |        |

\* CMAB22033A: MADE BY ALPS ELECTRIC CO., LTD.  
\* FUNCTION → only PLAYBACK

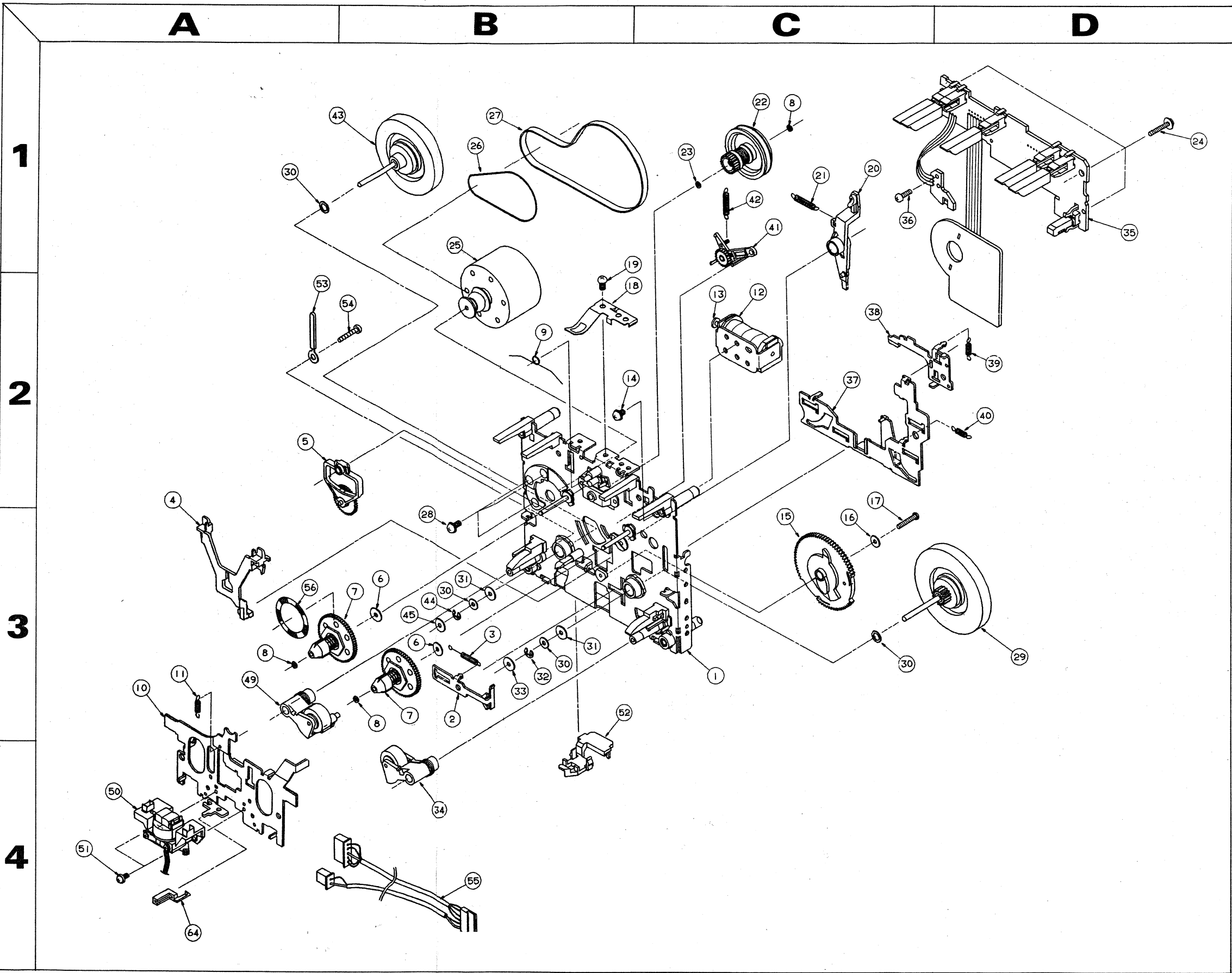




## Parts List & Exploded View of Deck Mechanism (II)

| No. | Part No.   | Description |                                | Q'ty | Remark |
|-----|------------|-------------|--------------------------------|------|--------|
|     |            | Parts Code  | Parts Name                     |      |        |
| 1   | 5708904300 | F112-118    | Ass'y Chassis                  | 1    |        |
| 2   | 5708904310 | FC48R-25    | Cam Gear                       | 1    |        |
| 3   | 5708904320 | FK26H-13    | Spring Gear Cam                | 1    |        |
| 4   | 5708904330 | FD40K-26    | Lever Hold                     | 1    |        |
| 5   | 5708904340 | F017-048    | Ass'y Idler                    | 1    |        |
| 6   | 5708904350 | UJ12V-11    | Poly Slider 2.1×0.25 T         | 2    |        |
| 7   | 5708904360 | F105-027    | Ass'y Reel                     | 2    |        |
| 8   | 5708904370 | FJ111-17    | Poly Slider 1.7×0.25           | 3    |        |
| 9   | 5708904380 | FK26R-12    | Spring Holder                  | 1    |        |
| 10  | 5708904390 | FC48U-31    | Ass'y Head Plate               | 1    |        |
| 11  | 5708904400 | FK26N-14    | Spring Head Base               | 1    |        |
| 12  | 5708904410 | F265-252    | Ass'y Solenoid PKA<br>16145/AY | 1    |        |
| 13  | 5708904420 | PL366-11    | Plunger                        | 1    |        |
| 14  | 5708904430 | UG11S-14    | Screw 2.6×3.5 Z                | 1    |        |
| 15  | 5708904440 | FD40M-27    | CAM Gear(s)                    | 1    |        |
| 16  | 5708904450 | MJ112-22    | Washer 2.0 ZN                  | 1    |        |
| 17  | 5708904460 | UG12H-20    | Screw 2.0×13 ZNT               | 1    |        |
| 18  | 5708904470 | FC49E-12    | Spring Cassette Pushing        | 1    |        |
| 19  | 5708904480 | KG194-29    | Screw T2.6×5 ZN                | 1    |        |
| 20  | 5708904490 | FD40L-22    | Arm Play                       | 1    |        |
| 21  | 5708904500 | FK22G-11    | Spring Arm Play                | 1    |        |
| 22  | 5708904510 | FR20V-11    | Ass'y Clutch                   | 1    |        |
| 23  | 5708904520 | FJ111-19    | Poly Slider 2.1×0.13           | 1    |        |
| 24  | 5708904530 | UG15U-11    | Screw 2×13                     | 3    |        |
| 25  | 5708904540 | F064-250    | Ass'y Motor                    | 1    |        |
| 26  | 5708904550 | FF17H-13A   | Belt SUB.                      | 1    |        |
| 27  | 5708904560 | FF17G-11    | Belt Main                      | 1    |        |
| 28  | 5708904570 | FR21E-14    | Screw 2.6×5 ZN                 | 3    |        |
| 29  | 5708904580 | FG114-14C   | Ass'y Flywheel 2.5             | 1    |        |
| 30  | 5708904590 | FJ111-30    | Poly Slider 2.6×0.25           | 4    |        |
| 31  | 5708904600 | UJ13V-11    | Poly Slider 2.6×0.25 T         | 2    |        |
| 32  | 5708904610 | UG13U-12    | E Ring                         | 1    |        |
| 33  | 5708904620 | FJ141-11    | Washer Oil Seal<br>2.4×0.25 T  | 1    |        |
| 34  | 5708904630 | FR20W-11    | Ass'y Pinch Roller 2.5         | 1    |        |
| 35  | 5708904640 | F062-156    | Ass'y Sensor B'D               | 1    |        |
| 36  | 5708904650 | UG12H-26    | Screw 2×6                      | 1    |        |
| 37  | 5708904660 | FC48T-24    | Ass'y Slide Plate              | 1    |        |
| 38  | 5708904670 | FC48S-22    | Plate Control                  | 1    |        |
| 39  | 5708904680 | FK26M-13    | Spring Plate Control           | 1    |        |
| 40  | 5708904690 | FK26P-12    | Spring Slide                   | 1    |        |
| 41  | 5708904700 | F120-017    | Ass'y Gear Arm                 | 1    |        |
| 42  | 5708904710 | FK26K-12    | Spring Reverse Gear            | 1    |        |
| 43  | 5708904720 | FR20U-15    | Ass'y Fly Wheel 2.2            | 1    |        |
| 44  | 5708904730 | UG13U-15    | E Ring                         | 1    |        |
| 45  | 5708904740 | FJ141-14    | Washer Oil Seal                | 1    |        |
| 46  | 5708904750 |             | Not used!                      |      |        |
| 47  | 5708904760 |             | Not used!                      |      |        |
| 48  | 5708904770 |             | Not used!                      |      |        |
| 49  | 5708904780 | FR20Y-11    | Ass'y Pinch Roller 2.2         | 1    |        |
| 50  | 5708904790 | F257-162    | Ass'y Rotary Head              | 1    |        |
| 51  | 5708904800 | KG194-35    | Screw 2.0×5 ZN                 | 2    |        |
| 52  | 5708904810 | FD41U-25    | Lead Holder                    | 1    |        |
| 53  | 5708904820 | UH11Y-11    | LUG                            | 1    |        |
| 54  | 5708904830 | UG12H-14    | Screw 2.6×8                    | 1    |        |
| 55  | 5708904840 | WH48K-55    | Ass'y Connector                | 1    |        |
| 56  | 5708904850 | UT18G-15    | Plate Reflector                | 1    |        |
| 64  | 5708904860 | FD44F-11    | Protector                      | 1    |        |

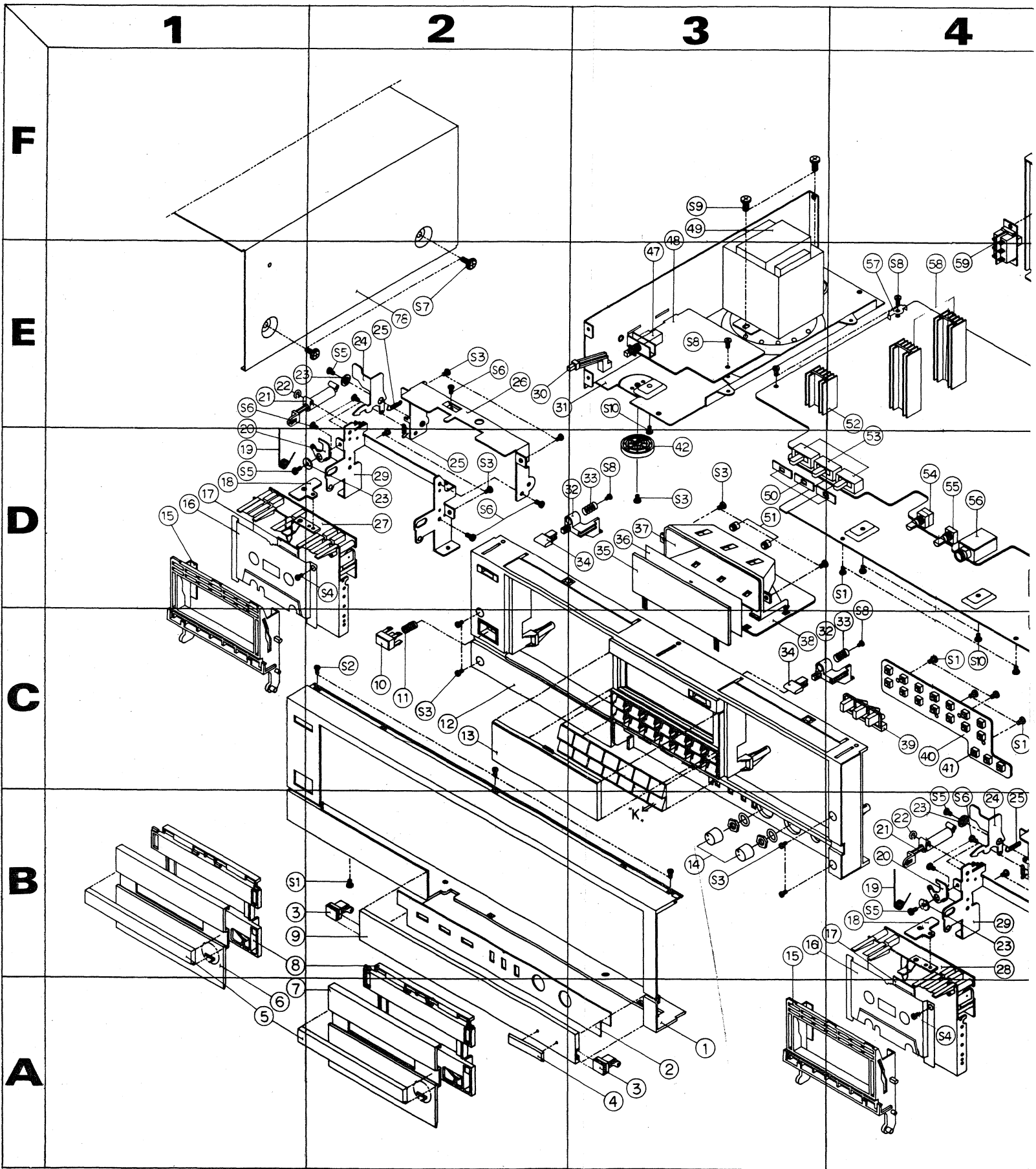
CMAB2Z034A: MADE BY ALPS ELECTRIC CO., LTD.  
FUNCTION → only RECORDING/PLAYBACK

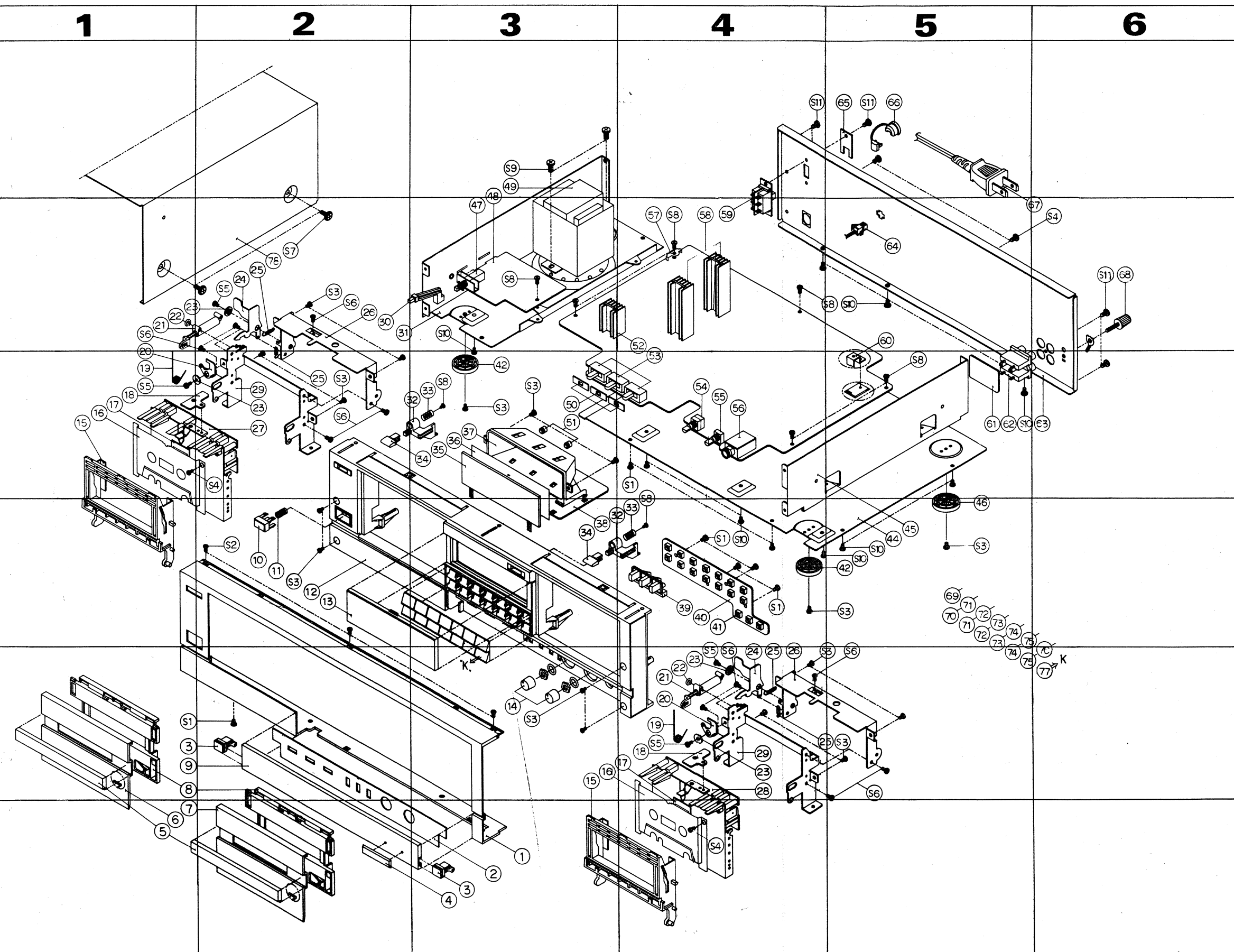


Parts List & Exploded View of Cabinet & Chassis

| No. | Parts No.    | Description                | Position   | Q'ty | Remark   |
|-----|--------------|----------------------------|------------|------|----------|
| 1   | 048602016011 | Panel-Front, Black         | A3         | 1    |          |
| 2   | 048623004011 | Plate-Function             | A3         | 1    |          |
| 3   | 6545000310   | Hinge-Door                 | A3, B1     | 2    |          |
| 4   | 048535022011 | Door-Ass'y, Function       | A3         | 1    |          |
| 5   |              | Not used                   |            |      |          |
| 6   | 048663000611 | Door-Deck (A)              | A1         | 1    |          |
| 7   | 048663000612 | Door-Deck (B)              | A1         | 1    |          |
| 8   | 8562001410   | Guide-Door                 | B1         | 2    |          |
| 9   | 048665000521 | Door-Function              | B1         | 1    |          |
| 10  | 048545048211 | Button-Power               | C2         | 1    |          |
| 11  | 6555004380   | Spring-Power               | C2         | 1    |          |
| 12  | 048521004711 | Body-Front                 | C2         | 1    |          |
| 13  | 048555021011 | Window, LCD                | C2         | 1    |          |
| 14  | 048545052211 | Knob-Rotary                | B3         | 2    |          |
| 15  | 8562001010   | LED Cassete                | B3, D1     | 2    |          |
| 16  | 048683000911 | Cover-Mecha                | B3, D1     | 2    |          |
| 17  | 2308270603   | LED ALD 980                | B4, D1     | 2    |          |
| 18  | 4002316030   | LED-PCB                    | B4, D1     | 2    |          |
| 19  | 6555603120   | Spring-Door                | B4, D1     | 2    |          |
| 20  | 6515011310   | Stopper-Eject              | B4, D1     | 2    |          |
| 21  | 6308001510   | Damper Air                 | B4, E1     | 2    |          |
| 22  | 8339020011   | Ear Ring (02)              | B4, E1     | 2    |          |
| 23  | 7015003320   | Bushing-Eject              | B4, E1, E2 | 4    |          |
| 24  | 6505083110   | Lever-Eject                | B4, E2     | 2    |          |
| 25  | 6555304410   | Spring-Eject               | B4, E2, D2 | 4    |          |
| 26  | 6503011910   | Bracket-Mecha (T)          | B4, E2     | 2    |          |
| 27  | 5708008310   | Deck-Mecha (A)             | D2         | 1    |          |
| 28  | 5708008320   | Deck-Mecha (B)             | B4         | 1    |          |
| 29  | 6503012010   | Bracket-Mecha              | B4, D2     | 2    |          |
| 30  | 6305001410   | Shaft-Push                 | E2         | 1    |          |
| 31  | 6122616120   | Chassis-Main               | E2         | 1    |          |
| 32  | 8523009310   | Arm-Eject                  | D3, C4     | 2    |          |
| 33  | 6555005630   | Spring-Power               | D3, C4     | 2    |          |
| 34  | 8545052910   | Button-Eject               | C3, D3     | 2    |          |
| 35  | 2338179923   | LCD                        | D3         | 1    |          |
| 36  | 8535022410   | Diffuser                   | D3         | 1    |          |
| 37  | 6063001310   | Holder-LCD                 | D3         | 1    |          |
| 38  | 4002316010   | LCD-PCB                    | C3         | 1    |          |
| 39  | 8543015210   | Button-Tactile (3Key)      | C4         | 1    |          |
| 40  | 4002316000   | PCB, Front                 | C4         | 1    |          |
| 41  | 4658002910   | Switch-Tact                | C4         | 17   |          |
| 42  | 046035101511 | Base-Foot (A)              | C5, D3     | 2    |          |
| 43  |              | Not used                   |            |      |          |
| 44  | 6122412420   | Cover, Button, Black       | C5         | 1    |          |
| 45  | 6123618910   | Frame-Side, Right          | C5         | 1    | Domestic |
| 46  | 6035101510   | Base-Foot, Black           | C5         | 2    |          |
|     | 6035101511   | Base-Foot, Gold            | C5         | 2    |          |
| 47  | 4628048810   | Switch-Push, 1Key, Power   | E3         | 1    |          |
| 48  | 4002316020   | PCB, Fuse                  | F3         | 1    |          |
| 49  | 2825052307   | Power-Transformer          | F3         | 1    |          |
| 50  | 6705009310   | Slide-Cover                | D3         | 3    |          |
| 51  | 6715010410   | Lamp-Holder                | D3         | 2    |          |
| 52  | 7505201110   | Heatsink, Regulator Tr (B) | E4         | 1    |          |
| 53  | 4618005910   | Switch-Slide               | D4         | 3    |          |
| 54  | 3208052310   | RV 100KA×2                 | D4         | 1    |          |
| 55  | 3208052710   | RV 100KSW                  | D4         | 1    |          |
| 56  |              | Not used                   |            |      |          |
| 57  | 4235000110   | Plate-Ground               | E4         | 1    |          |
| 58  | 7505201130   | Heatsink, Regulator Tr (A) | E4         | 2    |          |
| 59  | 4618000410   | Voltage-Selector           | E4         | 1    | B        |
| 60  | 6505022811   | Bracket-PCB                | E5         | 1    |          |
| 61  | 4002315910   | PCB, Input                 | D5         | 1    |          |
| 62  | 4438102010   | Jack-RCA, 4 Pin            | D5         | 1    |          |
| 63  | 046102022921 | Chassis-Back, Black        | D6         | 1    | A        |
|     | 046102022931 | Chassis-Back, Black        | D6         | 1    | B        |
|     | 046102022941 | Chassis-Back, Black        | D6         | 1    | C        |
|     | 046102022951 | Chassis-Back, Black        | D6         | 1    | D        |
|     | 046102022961 | Chassis-Back, Black        | D6         | 1    | E        |
|     | 046102022971 | Chassis-Back, Black        | D6         | 1    | F        |
|     | 4428511240   | Connector-Ass'y            | E5         | 1    |          |
| 64  | 6515000630   | Holder-Voltage             | F5         | 1    | B        |
| 65  | 6518000710   | Stopper-Cord, AC, Black    | F5         | 1    | A, B     |
| 66  | 6518000111   | Stopper-Cord, AC, Black    | F5         | 1    | C, D, F  |
|     | 6518000110   | Stopper-Cord, AC, Black    | F5         | 1    | E        |
| 67  | 4308001410   | Cord-AC, Power, Black      | E6         | 1    | A, B     |
|     | 4308000430   | Cord-AC, Power, Black      | E6         | 1    | C, D     |
|     | 4308003610   | Cord-AC, Power, Black      | E6         | 1    | E, F     |
| 68  | 4408103710   | Terminal-Ground            | E6         | 1    |          |
| 69  | 048545052711 | Button-Cap, Rec            | C5         | 1    |          |
| 70  | 048545052712 | Button-Cap, Rec Mute       | C5         | 1    |          |

| No. | Parts No.    | Description              | Position   | Q'ty | Remark |
|-----|--------------|--------------------------|------------|------|--------|
| 71  | 048545052713 | Button-Cap, Rewind       | C5         | 2    |        |
| 72  | 048545052714 | Button-Cap, Reverse Play | C5         | 2    |        |
| 73  | 048545052715 | Button-Cap, Forward Play | C5         | 2    |        |
| 74  | 048545052716 | Button-Cap, Fast Forward | B5, C5     | 2    |        |
| 75  | 048545052717 | Button-Cap, Stop         | B5, C5     | 2    |        |
| 76  | 048545052718 | Button-Cap, Pause        | B6         | 1    |        |
| 77  | 048545052719 | Button-Cap, Relay Play   | B6         | 1    |        |
| 78  | 046122016311 | Cover-Top, Black         | E2         | 1    |        |
| S1  | 8109230081   | Screw, #2 BTC3×8ZNY      | B1, C4, D4 | 7    |        |
| S2  | 8129230061   | Screw, #2 FTC3×6ZNY      | C2         | 3    |        |
| S3  | 8159230081   | Screw, #2WPTC3×8ZNY      | C2, B3, B5 | 12   |        |
|     |              |                          | D2, E2,    |      |        |
|     |              |                          | C5, D3     |      |        |
| S4  | 8109230083   | Screw, #2 BTC3×8ZNB      | A4, D2, E6 | 4    |        |
| S5  | 8119430061   | Screw, SAM 3×6ZNY        | D1, E2, B4 | 4    |        |
| S6  | 8119426061   | Screw, SAM 2.6×6ZNY      | E1, D2, E2 | 10   |        |
|     |              |                          | B4, B5     |      |        |
| S7  | 8159440083   | Screw, WSAM 4×8ZNB       | E2         | 4    |        |
| S8  | 8159230061   | Screw, WPTC B3×6ZNY      | D3, D4, E3 | 8    |        |
|     |              |                          | E4, E5, D5 |      |        |
| S9  | 8159440081   | Screw, WSAM 4×8ZNY       | F3         | 2    |        |
| S10 | 8109230061   | Screw, #2 BTC3×6ZNY      | E3, C4, C5 | 11   |        |
|     |              |                          | E5, D5     |      |        |
| S11 | 8119230083   | Screw, #2 PTC3×8ZNB      | F4, E6, F5 | 7    |        |







## Point to Point Wiring Diagram

